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Job-Education Mismatch Among the Graduates: A Sri Lankan Perspective

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Abstract

When reviewing the literature with respect to skills mismatch it shows that there are different dimensions in this concept and these different dimensions take place due to mismatch in either demand or supply of labour. In Sri Lankan graduate job market, the skill mismatch is considered as an issue in the supply side. Therefore, most of the research had paid attention on the matters deriving from the supply side factors such as skill gap and skill shortage. However, skills mismatch is not always due to the supply side factors. It may take place due to the deficiencies in the demand side as well. Education mismatch (vertical mismatch and horizontal mismatch) is one of the main skill mismatch dimensions that occur due to the lack of labour demand. However, in the Sri Lankan graduate job market, there is a lacuna of research with regards to education mismatch dimension. Therefore, the objective of this study was to identify whether there is an education mismatch in the Sri Lankan graduate job market and if there is an education mismatch to decide whether this mismatch is a real or a formal. The study has adopted a deductive methodology and two types of declarative hypothesis were developed. The data were analyzed by using both descriptive statistics and inferential statistics. The findings of the study conclude that, there exists an education mismatch in the Sri Lankan graduate job market and the vertical mismatch is a formal mismatch while horizontal mismatch is the real mismatch.

Keywords*: education mismatch; horizontal mismatch; skill gap; skill shortage; skills mismatch; vertical mismatch*

1. Introduction

Skill mismatch explains the gap between the skills supplied and demanded. More than four decades ago, in Sri Lanka, skills mismatch had been interpreted as a skill gap[1] or as a skill shortage[2]. The country researches highlighted that skills of educated youth especially of the Sri Lankan graduates are not suited with the private sector employment opportunities and its job requirements (International Labor Organization, 1971). Those who stress the traditional view

1 *Skill gap is where skill levels in the work place are below those desired by employers or when job requirements do not match precisely the content of the knowledge or abilities of individuals.*

2 *Skill shortage is where there are not enough individuals with required skills within the economy to fill existing vacancies.*

of the skill mismatch hypothesis implicitly believe that, although the economy has employment opportunities, for some job categories job seekers are not adequately found and for majority of the other jobs that are available job seekers do not have necessary skills (Gunatilaka, 1999; Dickens & Lang, 1996; Rodrigo, 1994; Kelly, 1993; Gunatileke, 1989; Chandrasiri, 2008).

Private sector business leaders believe that this mismatch is primarily due to the problems of educational structure, quality and the content of the educational system, particularly university system has failed to provide the required skills, aptitudes, and job orientation for the graduate workforce (Amarasinghe, 1996). This clearly explains that the skill mismatch in the country is an issue of the supply side of the labour. But Senarath (2006) revealed that the university education system has been now more geared towards skills development. Especially, universities are now seriously engaging in changing their teaching-learning package consistent to the current requirements of challenging business environment. Accordingly, student centered teaching methods are being practiced instead of teacher centered teaching methods. This permits students to have a greater initiative for self learning through investigation and analysis, project work of different sorts which involves not only individual work but also team or group work etc for them to develop their skills during the last decade.

Above discussions confirm that authorities have taken steps to reduce the supply side skill mismatch issues during the past decade. However, even after these actions have been implemented the issue of skill mismatch still exists. When looking at the literature in other countries, they have identified that skill mismatch is not always a problem due to inefficiencies in the supply side. They clearly argue that skill mismatch can take place due to demand side issues as well. For instance if the number of graduates in the job market exceeds the demand, the reverse scenario will occur. If the economy is unable to produce enough job opportunities to absorb the excess supply of graduates, it may be difficult to find a suitable job for the graduates.

Due to this disparity, the educated youth have to either wait until they could find a suitable job for their qualifications or accept any job without considering the qualifications or field of study (Cedefop, 2010). As described by Cedefop (2010), when a person is engaging in a job apart from the level or field of study it is called as the Job Educational Mismatch or 'Education Mismatch' and this is an another dimension of skills mismatch. When a person is educationally mismatching, he or she will be unable to utilize the skills that acquired through learning and also unable to gain real output from the investment made on the education (Green & McIntosh, 2007).

Past researchers particularly in the developed countries like Europe, have found that job-educational mismatch (education mismatch) is a more prominent problem among the graduates than skill shortage or skill gap (Allen & Van-der-Velden, 2001; Di Pietro & Urwin, 2006; McGuinness, 2006). Even Senarath (2012) has found that the formal economy in Sri Lanka (public sector + formal private sector) has failed in generating enough jobs to take up the graduates of local universities and therefore it has created an excess supply of graduates. This excess supply of graduates will have no proper job opportunities and therefore they have to take up the jobs which require low level of education and low level of skills and competencies than what they have acquired. However, still a considerable level of attention has not been given by the researchers on the dimension of education mismatch in Sri Lanka. Therefore, the main objective of this study was to reveal whether there is an education mismatch in the Sri Lankan graduate job market and if there exist an education mismatch whether the mismatch is a real or a formal problem. That is, if they are educationally mismatched it leads to a problem in utilizing the skills that they acquired. The study was done with special reference to management graduates in Sri Lanka who have passed out between 2005-2010 from University of Sri Jayewardenepura, University of Colombo and University of Kelaniya.

2. Literature Review

Education mismatch, generally, refers to the lack of coherence between the required and offered educational level for a given job (Betti, Agostino, & Neri, 2007). The issue of education mismatch has a long history and it had been first identified in the 1870's (Gladwell, 2008). In a report written under the title of "Relation of Education to Insanity" by United States commissioner of education, Jarvis, first revealed this concept. In this report he claimed that out of the 1,741 cases of insanity he studied, "over-study" was responsible for 205 (cited by Edwin & Hessel, 2011). As they mentioned, much attention was not paid on the issue of education mismatch. However, since the 1970s, considerable attention has been paid on this concept as supply of educated workers seemed to outpace the demand in the labor market (Freeman, 1975). Freeman (1975) predicted in his book of "The Overeducated Americans", about a situation with substantial oversupply of college graduates is likely to remain for many years to come (Edwin & Hessel, 2011).

Vertical mismatch and horizontal mismatch are the two types of education mismatch that had been identified by the European Centre for the Development of Vocational Training (Cedefop, 2010). Vertical mismatch occurs when the level of education that an individual is having is not suitable for the job. Vertical mismatch can occur in two ways, overeducation or undereducation. Overeducation exists when an individual is recruited for a job which requires lower level of education than those possessed by the individual. On the other hand, undereducation exists where the individual is having lower level of education than those are expected for the job. The logical end result of vertical mismatch is either the presence of overeducated workers who bring the skills to their jobs in excess of the skills required for that job, or undereducated workers' skills are inferior compared to those required for that particular job. According to Cedefop (2010), both these situations may result in negative consequences for the job market. However, in recent decades, as shown in table 1, there is a tendency towards a large increase of overeducated workers rather than the undereducated workers in the job market (McGuinness, 2006; Mavromaras and McGuinness, 2009).

Horizontal mismatch occurs when the type of education or skills that an individual is having, is inappropriate for the job. In accordance with horizontal mismatch person does a job unrelated to his or her field of study (Robst, 2007). It is also worthy to study about to what extent horizontal mismatch prevails in the case of graduate employment. Very often it has been found that particular fields of study provide occupationally specific skills for the job market in contrast to the general degree programmes in Arts, Humanities, Social Sciences, etc. (Robst 2007). As such, graduates in narrower fields of study (such as law or medicine) are likely to have a better defined set of job skills than those in more broadly defined ones (such as arts and humanities). Kucel and Byrne (2008) suggest that those from broader educational backgrounds are likely to be less well informed about labour-market opportunities.

Vertical and horizontal mismatches can occur due to three reasons. First, large number of skilled workers exists for the limited number of skilled jobs in the economy (Green & McIntosh, 2007). In such a situation, policy recommendation was suggested by Green and McIntosh (2007) to reduce the number of people receiving higher levels of education since the economy is essentially producing too many skilled individuals with a concurrent waste of resources. However, such a recommendation is not properly absorb in making policy decisions by the governments in many countries especially in Sri Lanka, where the policy decisions are focused mostly on the quantity than improving the quality. Therefore the most appropriate policies should be to encourage employers to raise their demands for skills to match the skills possessed by the job seekers (Senarath, 2006).

Table 1: Major studies of Overeducation between 2000-2008

Name of the study	Year	Methods adopted	Country	Data collection	Incidence of over education
Groot and Maassen van den Brink	2000	Meta-analysis			26.20% (a)
Dolton and Vignoles	2000	Self assessment –subjective job requirement	UK	1986	30.0%
Battu et al.	2000	(1) Subjective- satisfaction	UK	1996	40.4 (a)
				1996	40.7 (a)
		(2) Objective occupational dictionary-based measures	UK	1996	21.75 (a)
				1996	22.15 (a)
		(3) Subjective- degree requirements	UK	1996	33.65
				1996	38 (a)
Groot and Maassen van den Brink	2000	(1) Objective standard deviation-based measure	Netherlands	1994	11.85 (a)
		(2)Objective occupational dictionary-based measures	Netherlands	1994	15.9 (a)
		(3) Subjective	Netherlands	1994	11.15 (a)
Daly et al.	2000	Subjective- required education	US	1976	37.75 (a)
			US	1985	32.65 (a)
			Germany	1984	17.5 (a)
Vahey	2000	Subjective-required education	Canada	1982	31 (a)
Cohn and Ng	2000	Objective modal measures	Hong Kong	1986	35 (a)
				1991	34 (a)
Allen and van der Velden	2001	Subjective-required education	Netherlands	1998	14.00
Dekker et al	2002	Objective occupational dictionary-based measure	Netherlands	1992	30.60
Bauer	2002	Objective standard deviation –based measure	Germany	1984-98	11.5 (a)
Büchelvan and van Ham	2002	Subjective- job requirements	Germany	1998	15.8 (a)
Dolton and Siles	2003	Subjective-not clear which one they used	UK	1998	22.00
Gottschalk and Hansen	2003	Occupational classification	US	1996	5.00
Chevalier	2003	(1) Objective occupational dictionary-based measure	UK	1996	17 (a)
		(2) Subjective- job requirements	UK	1996	32.4 (a)
		(3) Subjective-satisfaction	UK	1996	16,20 (a)
McGuinness	2003a	Subjective- job requirements	Northern Ireland	2000	20.00
McGuiness	2003b	Subjective-job requirements	Northern Ireland	1999	24.00
Cardoso	2007	Occupational classification	Portugal	1986	5.00
				1999	1.00
Galasi	2008	Subjective job Requirements	25 countries	2004-06	33.00
Green and Zhu	2008	Subjective job requirements	UK	1992	26.40
				1997	26.50
				2001	32.50
				2006	37.30
Grazier et al.	2008	Occupational classification	UK	1994	40.00
				2004	30.00

(a) Average, (b) Males only
Source: McGuinness (2006)

The second possible explanation for the existence of education mismatch is the asymmetry of labour market information (Cedefop, 2010). Due to lack of information about

jobs in the job market, the graduates would not be assigned to jobs that they can make full use of their skills (Green & McIntosh, 2002). The third possible reason is employee skills are heterogeneous with the existing education system and the pattern of education. Therefore, individuals may consider themselves as overeducated for the job in terms of formal or paper qualifications, but when their skills or abilities are concerned they may be suited for the current job (Green & McIntosh, 2002).

Apart from identifying the reasons for education mismatch, it is important to identify repercussions of graduates being educationally mismatched. The impact of education mismatch has been discussed by prior researchers as a multi facet perspective (Belfield & Harris, 2002; Di Pietro & Urwin, 2006). Economists and sociologists have discussed the impact of education mismatch on the efficiency pertain to socio-economic costs at individual, firm and national level. At individual level, it would let down the individual's marginal product, though the estimated wage differs across the countries' status (Wolbers and Maareten, 2003; Robst, 2007 and Boudarbat & Montmarquette, 2009). At the firm level, education mismatch is leading to lower productivity and lower level of job involvement; and in case of high turnover rates, firms may have to bear extra costs on screening, recruiting and training of new employees repeatedly (Van Smoorenburg & Van der Velden, 2000). When the society being concerned the economy will lose output that could have been generated by allocating the real mismatch workers to higher productivity level (Chevalier, 2003).

Education Mismatch: Empirical Literature

As per table 1 prepared based on McGuinness (2006), most researchers had emphasized the education mismatch on the basis of overeducation and they considered it as the most prominent education mismatch issue among graduates. Most of the researches on education mismatch have been done in Europe were based on both subjective and objective methods. These data revealed that the percentages of overeducation have increased substantially in the same country when analysis is done for several years later. In particular, education mismatch in United Kingdom (UK) and United States seems that workers range between 17 percent and 42 percent of the total employed graduate labor force, while in Italy the share of overeducated workers was around 39 percent (McGuinness, 2006). These figures indicated that education mismatch is a major issue particularly in the western countries even. Further, the present economic recession of these countries has led to increase their level of unemployment to an unprecedented extent. These data show that the graduates around the world will find it difficult to obtain a proper job to be matched with their educational attainments and they might have to settle down with whatever job that they can find in the job market ignoring their qualifications.

Allen and Weert (2007) have also done a cross country analysis regarding the education mismatch and identified great differences between the types of education mismatches across the countries. They revealed that, overeducation is most common in Japan and under education is the biggest problem in UK. Spain experienced both overeducation and undereducation problem. Japanese and British graduates were more likely to work in a different field whereas German and Dutch graduates mostly like to select work with a perfect match in terms of level and field of education (Allen & Weert, 2007).

According to the preceding literature, it can be concluded that education mismatch is a common phenomena in many countries. Moreover, it is important to review prior arguments and findings relating to the nature of the education mismatch. Garcia-Espejo & Ibanez (2006) have found that lower level returns to education may also incur some non-transitory costs i.e. lower level of job satisfaction, frustration and higher turnover rate. The British Labour Force Survey (2003-05) which had been focused on types of degrees and the nature of the job finding

process highlighted that overeducated men and women earn less income than who occupied well matched job. Robst (2008) found that income penalty for horizontal mismatches appear to exceed than vertical mismatches. However, he argued that incidences of vertical and horizontal mismatch do not differ substantially among higher educated workers. On the other hand, among the middle educated workers horizontal mismatch is dominant.

Relationship between Education Mismatch and Skills Utilization

Education mismatch alone may not reveal the real nature of the problem. Therefore, it is important to study the relationship between education mismatch and skills utilization (Sgobbi, 2011). This can be done by analyzing the correlation between overeducation and skills underutilization (proxy of overeducation) as well as undereducation and skill deficit (proxy of undereducation).

There are two theories that explain the relationship between these two dimensions. First, the job assignment theory developed by Sattinger (1993) argues that employees working below their educational level (overeducated) find that the characteristics of the job impose a limitation to use their skills. This decreases the productivity and the income of the overeducated job holder. Conversely, employees working in a job which required the higher level of skills and education than the individual is having (undereducated) also decreases the productivity. However, in this case, the worker's own abilities are the main factor which limits the productivity.

The counter argument for job assignment model or the second theory is that, even amongst individuals with the same level of education qualifications, there is significant variability, in terms of skills endowments and abilities. This was called as the heterogeneous skills theory (Di Prieto & Urwin, 2006). Thus, it is quite possible to find workers who appear to be overeducated. However, because of their lower level of skills and abilities are at the bottom of the range of people with similar qualifications.

Green and Zhu (2010) developed a multidimensional index to check whether overeducated people are having a problem of skill underutilization (over skilling) and they categorized these individuals as 'real mismatch' (based on assignment theory). For those who are overqualified but having no problem in skill utilization were categorized as 'formal mismatch' (based on heterogeneous skills theory). The important factor highlighted was that formal mismatch not a serious problem to be addressed. However, if overeducated are finding it difficult to utilize their skills obtained in the job that they are currently doing it is a serious issue to be looked into. Therefore, focus needs to be directed on the real mismatch.

The studies in other countries with regard to the relationship between education mismatch and skills mismatch (skills utilization) provide evidences to support both of these theories. Allen and Van-der-Velden (2001) studied the relationship between skill mismatches and education mismatches and they found that there is no relationship between these two dimensions and supported the heterogeneous skills theory. In this research, Dutch graduates who were working in jobs that were not closely related to their level and/or field of study, nonetheless, stated that they made great use of their knowledge and skills in their work. About 15 percent of overeducates indicate skill under-utilization, and about 49 percent of undereducates indicate skill deficit. The authors found that educational mismatch weakly related to skill mismatches, contrary to what they expected based on a hierarchical assignment model.

Further, using the results from 2001 British Skills Survey, Green and McIntosh (2002) expressed that both the heterogeneous skills theory and assignment theory are relevant in certain situations as a cause of (formal and real) over-qualified status. Since the above two analysis (Allen & Van-der-Velden, 2001; Green & McIntosh, 2002) have given contradictory opinion regarding the relationship between education mismatch and skill mismatch, another cross country analysis was conducted by Allen and de Weert (2007). They also examined

the relationship between education and skill mismatches using comparable survey data for graduates from Spain, Germany, the Netherlands, United Kingdom, and Japan. Accordingly, education and skill mismatches are generally related, and graduates in jobs, above their educational level or outside their fields use less skills and knowledge obtained from university than those in matching jobs. The relationship between educational mismatches and use of skills and knowledge is weakest in Germany and the Netherlands and greater in the UK and Japan.

Sri Lankan Evidences of Education Mismatch

In Sri Lanka, education mismatch has been considered as an issue of underemployment. According to the definition of Department of Census and Statistics (DCS) of Sri Lanka, a person is considered as underemployed if he or she has worked less than 35 hours per week in the main occupation and is prepared and available to do more work, if offered (Annual Report of Sri Lanka Labour Force Survey [ALFS], 2009). According to this definition of underemployment, ALFS (2009) indicated that the overall underemployment rate was 3.8 percent of total employment and amongst highly educated (equal or higher than General Certificate of Education, Advanced Level) the underemployment rate was 3.3 percent. There is a gender disparity in underemployment. The DCS shows that 5.2 percent of the educated females were underemployed while 2.3 percent of the educated males were underemployed. This tells us the educated youth of the country has not yet been properly utilized. The statistics on underemployment is considered only the "visible underemployment". However, for a country invisible underemployment is also much more important because it is characterized by underutilization of skills and low productivity. Therefore this study attempts to fulfil this research gap.

3. Methodology

The study has adopted a deductive approach of research. At the outset of the study, two declarative types of hypotheses have been developed with a view to study the nature of the education mismatch in Sri Lanka, and to identify the correlation between education mismatch and skills utilization. The two hypotheses are as follows:

> H_1: Education mismatch is a prevalent condition in the graduate labour market of Sri Lanka.
>
> H_2: There is a strong correlation between education mismatch and skills utilization (underutilization/deficit) in the graduate labour market in Sri Lanka.

Based on the literature review, the conceptual framework (figure 1) was developed for analyzing the nature of the issue of education mismatch among graduates. According to figure 1, the nature of the jobs undertaken by the Sri Lankan graduates is considered. The nature of the job has been identified by reviewing the relevance of the job for the level of education of the graduate and the field of study. The level of education of the graduate has been considered by using three dimensions such as well matched, overeducated and undereducated. Overeducated and the undereducated represent the vertical mismatch among graduates. Two positions have been taken into account relating to the relevance of the field of the study of the employed graduate. Whether the job is in the same field or in the different field are the two dimensions that have been considered in relating to relevance of the field of study. The graduates who are doing jobs in a different field of study show the horizontal mismatch.

As revealed in the literature, education mismatch in a country is a serious issue if the

problem is accompanied by skills utilization. If education mismatch has an impact on skill utilization it is called a real education mismatch problem and otherwise it is a formal problem. Therefore, as illustrated in the last three cages in figure 1, this study also attempted to see whether the education mismatch in the graduate job market of Sri Lanka is a real problem or not.

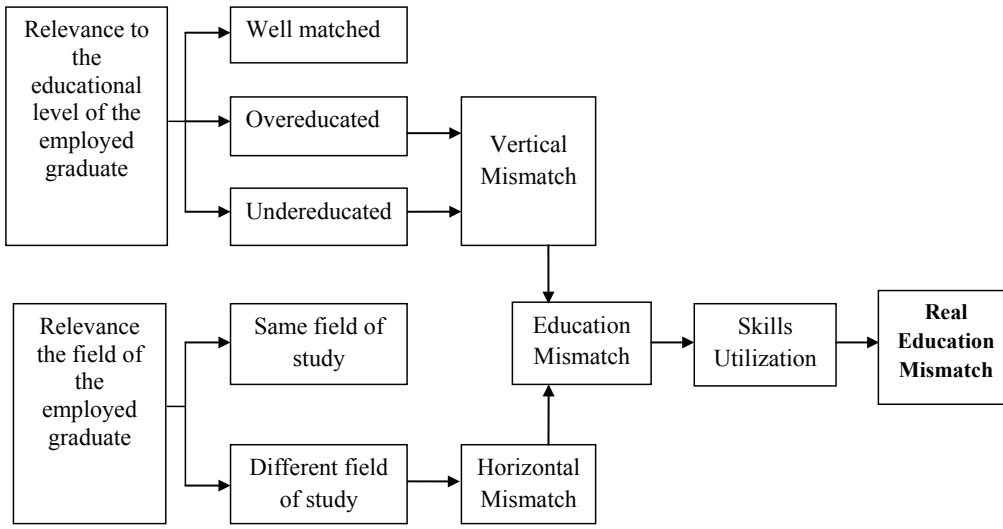

Figure 1: The nature of the issue of education mismatch among graduates of Sri Lanka

Data and procedure for testing

Conceptual frameworks illustrated in figure 1 was tested based on the survey data. The questionnaire consists with two parts including basic profile of the respondent (age, gender, etc.) and the Likert scale questions. The study is based on the self assessment method (Subjective Method) ignoring the other two methods of job analysis method/objective method[3] and realized the mismatch (that measures the degree of education-job mismatch by two variables such as years of schooling and occupational group of a job holder).

The questionnaires were administered among the graduates who have graduated during the period of 2005-2010 from Management Faculties in University of Colombo, University of Sri Jayewardenepura and University of Kelaniya, Sri Lanka. There is a high probability that, currently these graduates may involve in their first job and they sometimes may ready to accept any job regardless of their qualifications, because they are still novices to the labour market. Graduates who passed out from Management Faculties were selected because of all these graduates have completed four year degree program. On the other hand, graduates who followed a four year special degree have been trained well for a specific field such as accounting, marketing, and human resource management, etc. and hence for specific job. Therefore, the education and skill mismatch is more conveniently measurable and understandable with such a sample. 400 questionnaires were sent via e-mail and 386 completed questionnaires were received and the response rate was 96.5 percent.

The descriptive statistics were used to analyze the first hypothesis. Secondly, binary logistic regression tool of inferential statistics was applied in order to analyze the nature of the education mismatch with respect to educational characteristics (from degree only to more

3 *Under this method a professional job analysts grade the jobs and recommend the minimum educational requirements for a certain job/occupation).*

additional qualifications possessed), employment characteristics (from the nature of the job to types of jobs undertaken), and gender characteristics (male or female). In testing the second hypothesis, correlation analysis was undertaken in order to identify the correlation between overeducation and skill underutilization as well as undereducation and skill deficit.

4. Results and Findings

According to the survey results, 54 percent of the graduates acknowledge that the education obtained is closely matched to the skills required to carry out their job successfully, and 25 percent of the graduates expressed that they are overeducated while 21 percent of the graduates state that they are undereducated (see figure 2).

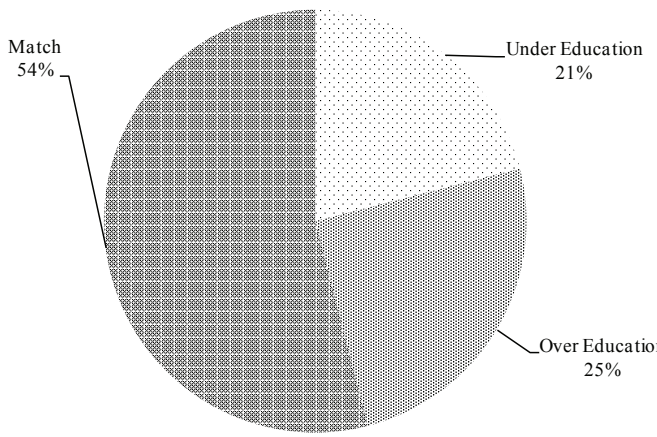

Figure 2: Vertical Mismatch (Percentage) of Sri Lankan Graduates

According to the primary data presented in figure 2, the total of overeducation and undereducation (overall vertical mismatch i.e. the level of education that an individual is having is not suitable for the respective job) is 46 percent. This figure indicates that vertical mismatch which has been considered as the major indicator of education mismatch, is substantially high in Sri Lanka compared to the research findings of Allen and Van-der-Velden, (2001) on education mismatch in Austria, Belgium, Czech Republic, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Switzerland and the United Kingdom. In these countries, averagely around 10-30 percent of the graduates are mismatched vertically. Consequently, 46 percent of vertical mismatch was identified in Sri Lanka, clearly demonstrates that there is a high degree of education mismatch in graduate labour market in Sri Lanka compared to other countries, especially the developed countries. On the other hand, the percentage of the matched employed graduates (54 percent) is relatively low when compared with the findings of other similar researches. For example, Di Pietro and Urwin (2006) and Boudarbat and Montmarquette (2009) found that average matched graduates' percentage is between 65-75 percent. This comparative data further prove that the existence of a chronic education mismatch in the Sri Lankan graduate labour market is severe as skill shortage and skill gap.

The findings based on the descriptive statistics of this study are similar to the existing literature. According to Allen and Van-der-Velden (2001) and Di Pietro and Urwin (2006),

overeducated percentage of graduates is higher than undereducated percentage. This is true in the Sri Lankan graduate labour market as well. As per the findings of McGuiness (2006), average rate of the overeducated graduates lies around 30 percent in most of the countries in Europe and United State of America. Even though the overeducation percentage of Sri Lanka (25 percent) is less than that it is very closer to the average rate. Thus similar phenomena can be seen in Sri Lanka as in most other countries.

Among the graduates in the sample, 21 percent believe that they are undereducated, which is likely to be perceived as serious from the education providers' point of view. According to Sgobbi (2011), among the Italian graduates this rate is 14.1 percent. A relatively high percentage of the undereducated people in Sri Lanka show the inappropriateness of the higher education system for fulfilling the needs of the Sri Lankan job market. However, one can attribute this prevailing high level of undereducation situation in Sri Lanka to the low self-confidence of individuals who are having a limited experience in the labour market.

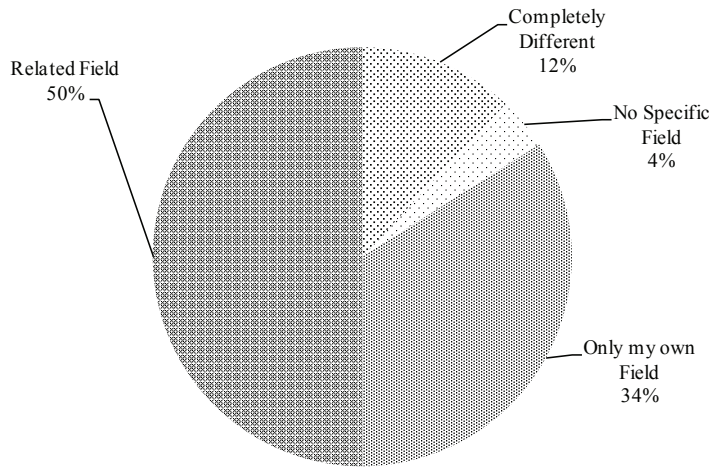

Figure 3: Horizontal Mismatch (Percentage) of Sri Lankan Graduates

This study also identified that 34 percent of graduates' jobs are related to their own field of education, and another 50 percent indicate that they are working in the related fields (see figure 3). Contrary, 12 percent of the graduates have stated that they are working on different fields, and further 4 percent have mentioned that their jobs are not related to the field of specialization. Altogether, 16 percent of the graduates are engaged in jobs which are not relevant for their field of study or their expertise. This reveals that there is a situation of horizontal mismatch among the graduates in Sri Lanka. Allen and Van-der-Velden, (2001), revealed that averagely 8 percent of graduates were horizontally mismatched among 13 countries (Austria, Belgium, Czech Republic, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Switzerland and the United Kingdom). It can be concluded that, Sri Lankan graduate job market represents a high degree of horizontal mismatch.

Logistic regression has been applied to predict the categorical (usually dichotomous) dependent variable from a set of independent variables. This technique finds the relationship between the independent variable and a function of the probability of occurrence of the dependent variable. The function of the probability of occurrence is the logit function, also

is called the log-odd function. In this study logistic regression is undertaken on the areas of education characteristics, employment characteristics and demographic characteristics.

Accordingly the overall matches and mismatches are dichotomously numbered, i.e. the dependant variable takes value "1" if the job is not closely related to the graduate's degree (overeducated, undereducated and graduates who are working in a different field are considered as mismatch), and otherwise assigned "0" (if the job matches with the education received). Then the logistic regression analysis is to be run using SPSS, where each of the demographic variables will be compared through the means of an odds-ratio. The odds ratio is a way of comparing whether the probability of a certain event is similar for two groups. An odds ratio of 1 implies that the event is equally likely in both groups. If the odds ratio is greater than one it implies that the event is more likely in the first group. An odds ratio, less than one imply that the event is less likely in the first group. The outcomes reveal how much more or less likely the above characteristics in creating a mismatch compared to the base category.

Table 2: Logistic Regression on Education Mismatch and Education Qualifications

	B[a]	S.E.	Wald	Sig.[b]	Exp(B)[c]
Education Qualifications			40.691	0.000	
University only	0.843	0.188	20.015	0.000	2.322
University + Post graduate	1.664	0.294	32.038	0.000	5.278
University + Professional	0.565	0.160	12.494	0.000	1.759
Constant	-0.747	0.128	34.098	0.000	0.474

[a] These are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. Similar to OLS regression, the prediction equation is log $(p/1\text{-}p) = b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_3*x_3+b_4*x_4$

[b] These columns provide the 2-tailed p-value used in testing the null hypothesis that the coefficient (parameter) is 0. If a 2-tailed test is used, then each p-value is compared to preselected value of alpha. Coefficients having p-values less than alpha are statistically significant.

[c] These are the odds ratios for the predictors. They are the exponentiation of the coefficients.

N = 386

Education Mismatch vs. Education Characteristics: An Inferential Analysis

Education mismatch when looped with education characteristics/categories (degree only, degree + postgraduate qualification, degree + professional qualification, and degree + professional qualification + postgraduate qualifications), the logistic regression output (see table 2) provides number of points to inference. In general there is a significant impact from education qualifications on education mismatch ($p < 0.05$). In further analysis of the impact of each education category vis-à-vis to education mismatch, the category of degree + professional qualification + postgraduate qualification is chosen as the base category; this is because it has the least number of mismatched graduates. When comparing the other categories with the reference category, graduate with degree only is 2.322 times (indicated by the odds ratio) more mismatched, graduates with the degree + postgraduate qualifications are 5.278 times more mismatched, and graduates with degree and professionally qualifications category 1.759 times more chance of a mismatch compared with the base category. Hence, the study conclusively proves that graduates are educationally mismatched in Sri Lanka when their level of education and the job being engaged are concerned.

Education Mismatch vs. Employment Characteristics: An Inferential Analysis

When logistically regressing the employment characteristics associated with education mismatch (see table 3), impact of type of employment on education mismatch was statistically significant. In this analysis, the full time jobs are taken as the base category due to low amount of educationally mismatched graduates found in this category compared with the other categories. In comparison to the base category, probationary employees' category has an odd ratio of 2.451, and contract basis employees' category has an odd ratio of 2.941, highlighting that those two categories have a higher possibility of education mismatch compared to the base category.

Table 3: Logistic regression on education mismatch and type of employment

	B[a]	S.E.	Wald	Sig.[b]	Exp(B)[c]
Type of employment			26.437	0.000	
Part time	1.589	0.421	13.050	0.998	2.270
Probationary	0.896	0.241	13.791	0.000	2.451
Contract basis	1.079	0.283	14.559	0.000	2.941
Constant	-0.386	0.070	30.101	0.000	0.680

[a] These are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. Similar to OLS regression, the prediction equation is $\log (p/1\text{-}p) = b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_3*x_3+b_4*x_4$

[b] These columns provide the 2-tailed *p*-value used in testing the null hypothesis that the coefficient (parameter) is 0. If a 2-tailed test is used, then each *p*-value is compared to preselected value of alpha. Coefficients having *p*-values less than alpha are statistically significant.

[c] These are the odds ratios for the predictors. They are the exponentiation of the coefficients.

N = 386

Table 4: Logistic Regression on Education Mismatch and Nature of the Industry

	B[a]	S.E.	Wald	Sig.[b]	Exp(B)[c]
Industry			75.335	0.000	
Trading	1.204	0.451	7.129	0.008	3.333
Banking	2.169	0.399	29.537	0.000	8.750
Education	1.872	0.371	25.445	0.000	6.500
Public Admin	1.204	0.402	8.966	0.003	3.333
Manufacturing	1.609	0.400	16.189	0.000	5.000
Information technology	1.609	0.385	17.435	0.000	5.000
Business Services	1.609	0.432	13.877	0.000	5.000
Transport & logistics	-19.593	12710.133	0.000	0.999	0.000
Health Services	0.511	0.503	1.030	0.310	1.667
Other	0.223	0.427	0.273	0.601	1.250
Constant	-1.609	0.346	21.586	0.000	0.200

[a] These are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. Similar to OLS regression, the prediction equation is $\log (p/1\text{-}p) = b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_3*x_3+b_4*x_4$

[b] These columns provide the 2-tailed *p*-value used in testing the null hypothesis that the coefficient (parameter) is 0. If a 2-tailed test is used, then each *p*-value is compared to preselected value of alpha. Coefficients having *p*-values less than alpha are statistically significant.

[c] These are the odds ratios for the predictors. They are the exponentiation of the coefficients.

N = 386

Table 4 shows the association between the nature of the industry engaged and the education mismatch. The telecommunication sector was taken as the base category since it has the least number of mismatched graduates. With reference to the base category, graduates in the banking, education, manufacturing, information technology, business services are highly mismatched, and although the graduates in health services and those who work on other areas are mismatched, they are not statistically significant at 5 percent. Thus, the above analysis undertaken on different employment characteristics associated with education mismatch clearly indicates that there is an education mismatch in the Sri Lankan graduate labour market.

Education Mismatch vs. Gender Characteristics: An Inferential Analysis

The logistic regression on gender characteristics and education mismatch (table 5) shows that female graduates has an odd ratio of 1.371 (p = .013) compared to males, and there is a positive impact from education mismatch. However, these results are contradictory to prior research done by Boudarbat and Chernoff (2009). The detailed data analysis done based on descriptive and inferential analysis overwhelmingly supports the first hypothesis of the study that is Education mismatch is a more prevailing condition in the graduate labour market in Sri Lanka.

Table 5: Logistic regression on education mismatch and Sex

	B[a]	S.E.	Wald	Sig[b].	Exp(B)[c]
Female	0.316	0.128	6.135	0.013	1.371
Constant	-0.357	0.090	15.715	0.000	0.700

[a] These are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. Similar to OLS regression, the prediction equation is log (p /1-p) = $b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_3*x_3+b_4*x_4$

[b] 2-tailed p -value used in testing the null hypothesis that the coefficient (parameter) is 0. If a 2-tailed test is used, then each p -value is compared to preselected value of alpha. Coefficients having p -values less than alpha are statistically significant.

[c] These are the odds ratios for the predictors. They are the exponentiation of the coefficients.

N = 386

Relationship between Education Mismatch and Skills Utilization – An Inferential Analysis

In accordance with Allen and Van-der-Velden (2001), first, skills mismatch is categorized into two components in order to develop a relationship among the education mismatch and skills utilization. The first component was the skill underutilization (graduates are not getting to use their skills due to employment mismatch) and consider it as the counterpart of overeducation. The second component was skill deficit (graduates are not possessing sufficient skills with respect to job requirements) and consider it as the counterpart of undereducation. The research of Allen and Van-der-Velden (2001) was conducted on the premise, 'to accept the fact that education mismatch has an implication for skills utilization, and the skill under-utilization should be high among the overeducated graduates, and skill deficit should be high among the undereducated graduates'. Using the same methodology, this study too tests its second hypothesis, firstly using descriptive statistics and then, using inferential statistics.

First, according to the correlation results illustrated in table 6, overeducated graduates show a weakly negative correlation in skills underutilization. This indicates that overeducated graduates do not have a problem in utilizing their skills in their current job. This shows that skill underutilization does not have any correlation with the education mismatch. Nevertheless, the undereducated graduates show a positive correlation in skills under utilization (p < .001)

indicating a paradoxical situation, in which even though their jobs require more skills they have been unable to utilize their existing skills. Also graduates who are working in jobs different from the field of study also indicated a positive correlation with skill under-utilization. This may be due to working in a different field and they are unable to utilize their expertise and skills that they have acquired in the learning process.

Second, it has been tested the relationship between education mismatch and skill deficit (see table 7). The results show that there is a weak negative relationship between undereducated graduates and skill deficit (p = .014). This shows that undereducated does not seem as a serious skill deficit problem. Overeducated graduates are not statistically significant with skill deficit. Thus, it is evident that the skill deficit levels show that education mismatch is not a necessary or sufficient condition to skill utilization.

Correlation results do not support the second hypothesis: there is a closer correlation between education mismatch and skills utilization in the graduate labour market in Sri Lanka. However, this conclusion is analogous with the findings of Allen and Velden (2001).

Table 6: Correlation between Education Mismatch and Skills underutilization

		Match	Over Educated	Under Educated	Outside Field
Skill under utilization	Pearson Correlation	-0.023	-0.093 (**)	0.126 (**)	0.136 (**)
	Sig. (2-tailed)	0.466	0.003	0.000	0.000
	N	386	386	386	386

** Correlation is significant at the 0.01 level (2-tailed).

Table 7: Correlation between Education Mismatch and Skills deficit

		Match	Over Educated	Under Educated	Outside Field
Skill Deficit	Pearson Correlation	0.099(**)	-0.041	-0.078(*)	-0.009
	Sig. (2-tailed)	0.002	0.190	0.014	0.788
	N	386	386	386	386

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

5. Conclusion

Based on the findings, several conclusions can be drawn relating to the education mismatch among the graduates in the Sri Lankan job market. Firstly, it can be concluded that there is an education mismatch among the graduates of Sri Lankan job market. Under the education mismatch dimension, the vertical mismatch is not a very strong problem among Sri Lankan graduates compared with other countries especially as in Europe. This was further proved through the poor relationship identified between overeducation with skill under-utilization and undereducation with skill deficit. With respect to vertical mismatch, Sri Lankan graduates face with a formal mismatch rather than a real mismatch. Especially this may be a temporary situation in the graduate labour market due to information asymmetry and lack of experience.

However, the most significant finding was that 16 percent of the graduates in the sample were horizontally mismatched. Moreover, there is a positive correlation between horizontal mismatch and skill underutilization. This implies that horizontal mismatch is the real mismatch among the graduates and higher education authorities should concern more on this issue. This implies that, yet, the higher education system in Sri Lanka does not comply with the job market requirements. Especially with regards to the graduates in the management field they are hard to find job opportunities which are most relevant for their field of study. Because of this mismatch they are unable to utilize their expertise and skills they have acquired from the learning

process. Therefore, attention should be given on this education mismatch and the causes for this mismatch among the graduates in the Sri Lankan job market though there are plenty of job opportunities are available for the graduates who followed the management degree programme.

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