



Educational and skills mismatch of University Graduates with Labour Market Requirements in Construction Sector in Libya

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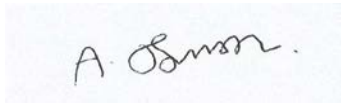
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Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or another institute of learning.

A handwritten signature in black ink on a light blue background. The signature appears to be 'A. Osman'.

Alhasan Salem Osman

Abstract

This thesis investigates the educational and skills mismatch between university graduates and the requirements of the Libyan construction industry labour market. Additionally, it descriptively discusses the expected determinants and reasons behind this mismatch. The data in the current study was mainly collected by using questionnaire.

With respect to the incidence of different types of educational and skills mismatch, in line with previous evidence obtained from developing countries, the results show that most employees have held jobs commensurate with their level of education in terms of the level of qualification (low horizontal mismatch). However, a sizeable number of those employees are believed to have a vertical educational mismatch with their jobs in terms of their specialisation. The findings of the present study show that the incidence of educational mismatch is representative, on average, of 30% of the sample for the study. Comparatively, the incidence of educational mismatch in Libya seems to be equivalent to what has been found in prior studies undertaken in other developing countries. With respect to skills mismatch, a considerable number of employees in the Libyan construction sector are perceived to have a skills mismatch with their job specifications.

The current study also statistically examines the relationship between certain characteristics of the participants in the study (e.g., gender, age, marital status, education, experience, and firm size) on one hand, and the level of job satisfaction on the other hand. The results reveal a significant association between these characteristics and employees' satisfaction.

This thesis addresses an existing gap in the literature of developing countries by providing evidence and analysis related to the incidence of education and skills mismatch with job specifications in Libya, which has experienced instability and uncertain circumstances in recent years. In addition, it discusses two important areas. First, the study identifies the role of workplace characteristics in determining the level and type of educational and skills mismatch. Second, it investigates the effect that these different types of mismatch could have on job satisfaction among employees in the Libyan construction sector. The results of the present study provide several implications for the practitioner and policymaker. Significantly, it has been noted in the results that the incidence of educational mismatch is attributed more to general degrees rather than specific degrees, and therefore, it is strongly recommended that policymakers in Libya encourage and support more specific-occupation types of qualifications.

Chapter 1 Introduction

1.1. Introduction

This chapter introduces the research background and motivation for the study and sets out the research objectives. The chapter then discusses the contributions of this thesis and follows this with the research design. Finally, the structure of this thesis will be outlined.

1.2. Research background

Investment in education, and particularly higher education, has been observed as dynamic for improving an individual's productivity and employability (Becker, 1975). This, in turn, raises individual income and social status (Teichler, 2002). The perceived benefits of higher education have convinced many students in Libya to pursue their studies beyond the secondary school level, leading to a growing requirement for tertiary education. The challenge for Libya and other countries is to ensure that this educational investment remains a dynamic and not disruptive force by matching the individual's job with their educational and skills level.

Understanding the relationship between education and labour markets is significant not only to graduates but also to educators, economists, and policymakers. There is no doubt that the quality of education and number of years of education have a great impact on the individual's future career. The risk of being unemployed or even employed in a job that does not match one's education, especially after long years of education, has both negative economic and social consequences on graduates and their societies.

Matching an individual's employment and his/her education and skills is important to realise the human capital stock of the workforce in the most efficient way. The existence of education-occupation mismatches has negative effects on the economy (McGuinness, 2006). On the macro level, national welfare is potentially reduced as the skills of workers are not fully utilised. At the institution level, Tsang (1987) studied the effect of educational mismatch on labour productivity and found that overeducated employees have negative effects on output. At the individual level, overeducated employees are not utilising their full investment in human capital and researchers have found that they tend to receive lower returns compared to those who are sufficiently matched (Hartog, 2000).

The concept of education mismatch refers to whether the individual has a level of education that is above or below the required level of education to proceed in a certain career (Hartog, 2000). Freeman (1976), in his book “the Overeducated American”, was the first to discuss the educational mismatch phenomenon. This book concluded that the decline in returns to education among new entrants to the labour market is due to the fact that the supply of graduates is higher than the demand for them in the labour market. Currently, there exists a substantial number of studies that explore the returns on educational mismatch. Most of these studies, however, focus on developed countries. Few studies have explored this field in developing countries, such as in the research done by Quinn and Rubb (2004) on Mexico and Abbas (2008) on Pakistan.

1.3. Motivation for the study

This research seeks to ascertain the educational and skills mismatch among Libyan graduates in the construction sector. The research investigates its determinants and its potential effects on job satisfaction and job-search behaviour. The data for the research collected using a questionnaire which completed by the University graduates who have been employed in the construction sector 3-5 years after graduation. Hence, the research contributes to the existing literature by providing empirical evidence on the incidence, determinants and effects of a mismatch in the supply of University Graduates with labour market requirements in the construction sector in Libya. Figure 1-1 shows the university graduates destination after graduation. They might face four possible options, which are: they got a job that matches their qualifications; on which is mismatched; they are unemployed; or they may seek employment overseas.

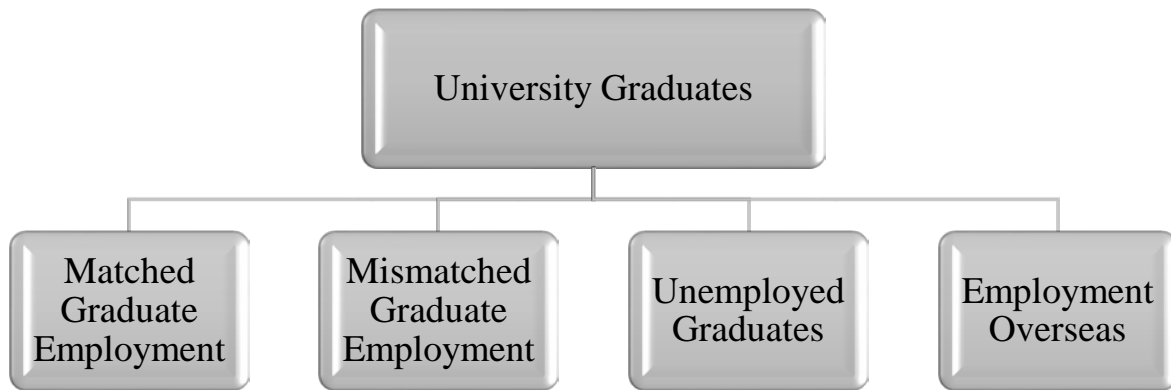


Figure 1-1 University Graduates' Employment Destinations

There has been growth in the number of higher education organisations in Libya, rising from two in 1975 to 76 universities and technical and vocational organisations by the year 2015 (Libyan Organization of Policies & Strategies, 2016). As a result, the number of students and graduates has increased also. Based on data from the Ministry of Higher Education in Libya (2016), the number of graduates from universities increased from 36,855 during the academic year 2009-2010 to 48,095 during the academic year 2014-2015. Also, 45% of the labour force in Libya is from the higher education level (World Bank, 2015).

Potentially out-dated curricula and a lack of coordination between educational organisations and the requirements of the labour market are liable to lead to a sense of frustration among graduates at mismatched educational outcomes, which could create a sense of resignation or cynicism and have a damaging effect on economic and social cohesion. However, it is unclear if such a highly-educated workforce is required in Libya. This might put some graduates in a position where they might have an educational mismatch for their job. A study by the World Bank (2015) argues that the average educational achievement of the workforce has increased; there is a suggestion that the occupational structure of the labour market does not have the capacity to absorb the increased number of educated workers into

traditional graduate occupations. These arguments suggest that expansion of the supply of highly skilled workers, given the slower growth of demand for the same, might potentially impact unfavourably on the individual as well as the economy, at least in the short run (Duncan & Hoffman, 1981). Moreover, the detrimental effects of educational mismatch have the potential to persist even in the long run (Hartog, 2000).

Based on the above, university graduates in Libya might be not matched with labour market requirements. Studies in different countries have indicated that there is an impact on wages when there is a mismatch with the labour market. Many graduates are employed in jobs for which a degree is not required, and in which the skills they learned in higher education are not being fully used. The challenges facing the labour market in Libya include a lack of coordination between educational organisations' output and the requirements of the labour market (World Bank, 2015).

Although a small number of studies have authenticated the incidence of educational and skills mismatch in developing countries such as Egypt and Tunisia (Bedir, 2014; Nadia, 2014; Hamida, 2012), there is no empirical analysis on the causes of such mismatch nor the effects of mismatch on individuals' well-being in terms of earnings outcomes, job satisfaction, job search behaviour and firm performance in the Libyan construction sector. Therefore, this study addresses this existing gap in the literature by investigating the association between education and skills mismatch and employees' satisfaction in the construction industry in Libya.

1.4. Importance of study

This thesis focuses on educational and skills mismatch in university graduates with labour market requirements in the construction sector in Libya. The former is defined as an employee who has attended a level of education that is higher than required for the position he or she occupies (McGuinness, 2006). The latter describes the extent to which employees are not able to utilise all their skills and knowledge in their current occupation and where they have more skills than are required for their current position (Mavromaras, McGuinness, & Fok, 2009). The limited literature has documented the incidence of educational and skills mismatch in North African countries such as Libya (Bedir, 2014; Nadia, 2014; Angel-Urdinola & Semlali, 2010).

The importance of this study can be seen in two dimensions; national and international. From the national aspect, this study is important for local policymakers and helps in understanding the determinants and causes of educational mismatch and skills mismatch in university graduates' outcomes in the labour market.

This study is important for international bodies such as the World Bank, International Monetary Fund (IMF) and International Labour Organization (ILO) by providing an empirical work on one of the developing countries; Libya, as there is a shortage of studies on this economy.

1.5. Study problem

The present study deals with the problem of educational mismatch in terms of skills and contributes to the recent literature. A large number of studies on educational mismatch and skills mismatch have focused on developed countries and in particular the UK, US, Australia, the Netherlands, and Spain (McGuinness, 2006). Apart from Quinn and Rubb (2006), who focus on Mexico, there is a scarcity of literature investigating this issue from the perspective of developing countries. The reviews of the mismatch literature by Hartog (2000), Sloane (2003), McGuinness (2006) and Leuven and Oosterbeek (2011) make very little or no mention of matching in low or middle-income labour markets. The main explanation revolves around the paucity of data in developing countries.

1.6. Aim and objectives

This research aims to study the educational mismatch between university graduates and the Libyan construction sector to determine the effects of this mismatch.

The major objectives of the research undertaken in this study are:

1. To reveal the level of education and skills of graduates from universities who have recently worked or are currently working in the construction sector.
2. To establish the nature and characteristics of the Libyan construction labour market.
3. To identify the determinants of educational and skills mismatch of graduates in Libya.

1.7. The scope of the research

This thesis focuses on the educational and skills mismatch of university graduates with labour market requirement in the construction sector in Libya. Educational mismatch is defined

as occurring where an employee has attended a level of education that is higher than what is required for the position he or she occupies (McGuinness, 2006). The skills mismatch describes the extent to which employees are not able to utilise all their skills and knowledge in their current occupation and where they have more skills than is required for their current position (Mavromaras et al., 2009). The limited literature has documented the incidence of educational and skills mismatch in North Africa countries such as Libya (Bedir 2014; Nadia 2014; Angel-Urdinola & Semlali 2010).

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The scope of this study addresses Libya as a developing country with a median income, to investigate the determinants and causes of educational mismatch and skills mismatch of university graduates' outcomes in the labour market. This research concentrates on graduates from universities in Libya who have worked in the construction sector recently, between 3-5 years after their graduation, which is the years between 2011-2016, because of changes in the labour market and the structure of the economy in general, and particularly in sectors with a high job-creating potential in Libya, such as construction. (Abuhadra & Ajaali, 2014).

1.8. Contribution to Knowledge

This research highlights the phenomenon of the lack of coordination between higher education outcomes and the requirements of the labour market which results in mismatches in the level of education and skills with labour market requirements. This research seeks to clarify empirical evidence to understand the causes of this phenomenon in Libya as a developing country and to reach solutions that help decision-makers at the state level and educational organisations in Libya to reduce the size of the gap. The research seeks to determine the effects of this phenomenon on career prospects and job satisfaction for individuals.

This study contributes to the ongoing literature by;

- Providing evidence on the incidence and the effects of educational and skills mismatch within Libya.

- Investigating the effect of educational mismatch on the determinants of skills mismatch.
- Examining the relationship between educational mismatch and on-the-job search behaviour from a developing country perspective such as Libya.

Chapter 2 Literature Review

2.1 Introduction

This chapter reviews the theoretical and empirical literature on the mismatch in the labour market. This review defines the key terms and definitions commonly used in the mismatch literature, identifies mismatch studies and models and establishes the area of interest of the study. The analysis focuses on educational mismatch and skills mismatch and examines both phenomena from developed and developing countries perspectives, where possible. The organisation of this chapter is as follows. The second and third sections focus on the definition and measuring of mismatching in the labour market and evaluate the different concepts and measures found in this area. The fourth section focuses on the theoretical explanations for mismatching. Section Five summarise the empirical evidence on the incidence and determinants of educational mismatch and skills mismatch. Section Six focuses on the determinants of educational mismatch and skills mismatch. Section Seven focuses on the relationship between mismatch and job satisfaction. The relationship between educational mismatch and, job mobility and on-the-job search behaviour is elaborated in Section Eight. The final section summarises and concludes the discussion undertaken in this chapter.

2.2 Definition of educational and skills mismatch

2.2.1 Educational mismatch

Educational mismatch describes the condition where a graduate is vocationally or academically overeducated or undereducated to perform what the job requires (Sicherman, 1991). There are two fundamental types of education-related job mismatches; horizontal mismatch and vertical mismatch. A horizontal mismatch refers to a situation where the scope of a graduate's degree study is unsuitable for the job position even though the qualification level is suitable (Robst, 2008). On the other hand, a vertical mismatch occurs when the required level of education for a specific job is different from the actual level of education of the worker (Bejaković & Mrnjavac, 2014). The first economics author who highlighted the importance of over-education in his study of the US graduate labour market was Richard Freeman in 1976, in "The Overeducated American". Freeman's study showed the capacity of the US labour market to soak up the increasing number of educated workers (Freeman, 1976).

2.2.2 Skills mismatch

Skills mismatch is described as the extent to which employees use their skills in their jobs, which means that individuals occupied in employment where they are using a small proportion of their capacity or skills are considered over-skilled (Mavromaras et al., 2009). In contrast, being under-skilled is defined as a skills deficit, where the individual lacks the requisite skills for their job (Allen & van der Velden, 2001). Previous studies have referred to skills in general in terms of adaptability, problem-solving, self-confidence, self-discipline, teamwork, communication, spoken English, written English, information technology and numeracy skills.

2.3 Measurements of educational and skills mismatch

2.3.1 Educational Mismatch

Education mismatch is measured by comparing a person's current education with the required education for a specific role. Whereas measuring current educational attainment is relatively simple, obtaining information on the required education level is more difficult (Dolton & Silles, 2008a). There are three approaches that can be used to measure the required education, which are subjective, objective and statistical methods.

- I. **The subjective method [SM]**, is defined as Employee Self-assessment [EA]. It is based on an employee's own valuation of the level of education required to perform their job (Hartog, 2000). It is, therefore, considered extremely subjective as it depends on the employees' perceptions. This method has been used by Duncan and Hoffman (1981) and Sichernman (1991). In this approach, employees are asked about their perception of the required level to do their work and then the difference between their current level of education and the required level, which locates whether the employee is over/under-educated. Many studies based on this method have used different questions to inquire about employees' views. For instance, Duncan and Hoffman (1981, p. 171) asked the following question: *how much formal education is required to get a job like yours?* Another study by Alba-Ramirez (1993, p. 262) asked this question: *what kind of education does a person need in order to perform your job?* By looking to these two questions, one can conclude that the first question focuses on recruitment standards while the second focuses on the requirements for career performance. This means that the same person can give different answers to different questions, which makes use of this method questionable at times, and is the negative aspect of this model. The positive aspect of this method is that it provides up to date information

about current education requirements. A respondent classified as over-educated if his/her real education is greater than the required education for the career. Undereducated employees are defined as having an education level less than their work requirement. As a result, a well-matched employee is defined as someone whose employment level requirement is in line with his/her educational background (Zakariya, 2013).

II. The objective method [OM] is defined as the job analysis [JA] method. It uses the information given by professional analysts related to the qualifications required for a career [external assessment measure]. Probably the most famous sources of such information are the Dictionary of Occupational Titles [DOT] in the US and the Standard Occupational Classification System in the UK. These are used to measure educational mismatch by comparing current education with the model requirements for a given career. If a person's current level of education is higher than what is determined by an occupational job analysis for a given job, then he/she is considered as over-educated. However, if the level of education is lower than what the work requires, then the employee is considered under-educated. One of the criticisms of this model is that having the same job title does not necessarily mean that employees are doing the same tasks and they may even require a different group of experiences and different level of education (McGuinness & Bennett, 2007).

III. The realised matches method [RM] is defined as the statistical method and can be estimated using two approaches; the mean and the mode. The mean approach is the required amount of education for an employee as concluded from the mean years of completed study of all employees within the same career (Verdugo & Verdugo, 1988). Employees are then classified as over-educated or under-educated if their educational level is more than one standard deviation above or below their career's mean educational level. Those employees with a number of years of education which is classified within one plus or less standard deviation of the mean are deemed to be well-matched (Zakariya, 2012). The mode approach was used by Cohn and Khan (1995) and Kiker et al. (1997), who used the mode of the level of schooling instead of the mean. It also does not consider standard deviations. Employees who are above the mode value are considered over-educated while those below the mode value are considered under-educated, and those that equal the mode value are well matched. This method considers the current educational level of employees in any career as determined by hiring standards and labour market conditions rather than the job requirements themselves (Hartog, 2000).

2.3.2 Skills mismatch

Skills mismatch is usually specified through employee assessments asking about the employee's degree of skills utilisation in the current job. The exact questions change in many studies. One of the earliest studies in the Netherlands by Allen and van der Velder (2001) measured the degree of skills underutilization based on this statement: *"My current job offers me sufficient scope to use my knowledge and skills"*. A five-point scale was used (1 for none and 5 for strong). Over-skill was therefore specified by the extent to which one disagreed with the statement (4 and 5 on the scale). Later, in the UK, Green and McIntosh (2007) used the Skills Survey 2001 to measure employees' skills utilisation.

2.4 Theoretical approaches

This subsection explores the theoretical background of how mismatching is engendered in the labour market. It is also worth noting that there is no single unified and accepted theory regarding mismatch. Instead, existing theoretical frameworks within labour economics attempt to explain the phenomenon of mismatch in the labour market through the supply side and demand side approaches. Human capital and career mobility theories focus on the supply side, whilst job competition theories focus on the demand side. Assignment theories incorporate the supply and demand sides. This study has focused on the supply side. As a result, this study focuses on human capital and career mobility theories as an explanation for the phenomenon of mismatch in the labour market. Table 2-1 summarizes the theories that explain the phenomena of the educational and skills mismatch.

2.4.1 Human Capital theory

The human capital theory was developed by Becker (1964). It suggests that employees are paid in line with their marginal productivity that is decided by the extent of human capital. Organisations adopt their technology to reply to changes within the relative providers of educated people within the marketplace. Organisations return different production techniques that emerge likewise as changes within the relative provider of labour so as to attenuate prices and maximise profits. If the availability of skilled labour increases, this could cause a relative decrease in wages for skilled labour and consequently, organisations would modify their technologies to utilise the abundance of skilled labour at lower prices (Duncan & Hoffman, 1981). Below the classical human capital theory, the existence of education mismatch can be

explained by inefficiencies that happen in the labour market. (McGuinness, 2006). Educational mismatch does not essentially mean that the human capital theory does not hold however rather it would be a sign that organisations need time so as to regulate their production technologies to totally utilise the human capital stock (McGuinness & Bennett, 2007). This indicates that educational mismatch is considered to be a short-term phenomenon under the human capital theory that is presupposed to disappear eventually as organisations respond to changes in the relative supply (McGuinness, 2003). However, if the mismatch proves to be a long-term phenomenon, this might suggest that the labour market corrects slowly to changes in the relative supply of educated employees, which might be thought of as a challenge to the neoclassical theory (Sloane, Battu & Seaman, 1999)

2.4.2 Job Competition theory

This theory interpreted the educational mismatch phenomenon and named it job competition theory, which is founded on generating inequality (Thurow, 1975). The theory illustrated the demand aspect for educational mismatch and confirmed the significance of an individual's relative attitude in a career development queue. Each career demands particular characteristics and skills necessary to advance the career. The position of each individual in the queue to career advancement is determined by their accumulated experience and vocational or academic skills, permitting the employer to estimate or gauge the cost of additional training for each individual. Higher levels of education and accumulated years of expertise act as a springboard to propel career advancement from within the queue. The salient point in this context is that over-qualified graduates in a career have their wages determined by their job and not their skill characteristics. Employers value the over-educated, thereby lowering the cost of training even though they are going not to utilise the extra education these employees possess (McGuinness 2006). Students are motivated to acquire additional years of education to put themselves in a higher position within the queue, which improves their likelihood of obtaining employment. Thurow's theory indicates that wages will be specified by work characteristics and not by the person's education level, as seen in the human capital theory. This means that excess education is not rewarded; instead, the education required for the job is what determines wages (Li, 2013).

2.4.3 Career mobility theory

The career mobility theory offers evidence that educational mismatch supports an extended human capital theory (Sicherman & Galor, 1990). This theory gives two explanations for the phenomenon of educational mismatch. Firstly, employees accept an entry level job that requires fewer years of education in order to obtain experience and later be promoted in their career (Büchel & Mertens, 2004). Secondly, educational mismatch of an employee might not be considered over-qualified for a special job if other components of human capital are thought of additionally to years of schooling that embody expertise and in employment training (Rubb, 2005). Overeducated employees may have less experience, training, and tenure than adequately educated employees (Robst, 2005). It is significant to note that the theory of career mobility does not provide a whole explanation of the mismatch phenomenon as it only provides an explanation for over-education rather than under-education (Büchel & Mertens, 2004). In addition, very few empirical studies using this theory have been able to explain the mismatch phenomenon in the labour market (Büchel & Mertens, 2004). In this situation, educational mismatch within the career mobility theory is interpreted as a short-term imbalance at career commencement, rebalanced as the graduate comes to terms with the increasing task complexity of career advancement.

2.4.4 Assignment theory

The assignment theory established by Sattinger (1993) can be considered as a mixture of human capital and job competition theory. According to Sattinger (1993), assignment theory specifies types of employment or sectors available to employees, the relevant differences between employees, the technology relating to career and employee characteristics to output, and the mechanisms that assign employees to careers. Assignment theory suggests that the marginal product of employees, in other words, the wage rate, is determined by their human capital as well as the occupation's characteristics. Wages are also linked to the availability and/or quality of jobs in the economy (McGuinness & Bennett, 2007). Unlike the job competition theory, the allocation process is not merely a lottery (Sala, 2011), but rather employees are motivated to select certain jobs based on income/utility maximisation. Therefore, employment is not only allocated based on an employee's characteristics but also on the career's characteristics. In other words, a number of skills supplied by the employee [i.e. the actual years of education] are determined by the costs and expected benefits from investment in education. On the other hand, the career requirements are the determinants of

whether the skills of employees are fully utilised or not (Groot & van den Brink 1997). Therefore, the educational mismatch is determined by both employees and career characteristics. For instance, if an over-educated employee is employed in a career that imposes a ceiling on productivity then he/she may earn less compared to others with the same level of education that were assigned to a job that matches their level of education (Abbas, 2008).

Table 2-1 Summary of the theories

Theory	Author	Features of the Theory
Human Capital theory	Becker (1964)	<ul style="list-style-type: none"> • Education mismatch can be explained by inefficiencies that happen in the labour market. • Organisations need time to regulate their production technologies to totally utilise the human capital stock. • Short-term phenomenon OR Long-term phenomenon.
Job Competition theory	Thurow (1975)	<ul style="list-style-type: none"> • Illustrated the demand aspect for educational mismatch and confirms the significance of an individual's relative attitude in work progression. • Overqualified graduates receive wages determined by work characteristics and not by a person's education level.
Career Mobility theory	Sicherman & Galor (1990)	<ul style="list-style-type: none"> • Employees firstly accept an entry level job that requires fewer years of education in order to obtain experience and be promoted later in their career. • Overeducated employees may have less experience, training, and tenure than adequately educated employees. • Short-term phenomenon.
Assignment theory	Sattinger (1993)	<ul style="list-style-type: none"> • A mixture of human capital and job competition theory. • The wage rate is determined by their human capital as well as the occupation characteristics. • The educational mismatch is determined by both employees and the career characteristics

Source: Author's work

2.5 Empirical Evidence of educational mismatch and skills mismatch

This section discusses the empirical evidence of the incidence of educational and skills mismatch in different countries. It first considers developed countries and then moves on to less developed countries.

To start with developed countries, there was a study by Duncan and Hoffman (1981), which used a self-assessment method in which people were asked about the academic level needed to perform their work. The years of schooling for each individual are compared with his/her actual educational attainment to work out the years of over/under-schooling. The study found a 42% incidence of over-education employees in the US. Another study in the US done by Rumberger (1987) estimated returns to educational mismatch by using the workers' self-assessment method. It was found that returns to over-education were lower than required education. The study related this to the incident that over-educated employees might not fully use their education in the workplace. The incidence of over-education was 35% in this study. Another US study by Verdugo and Verdugo (1989) has estimated the incidence of educational mismatch by using an objective method based measure, which found 10.9% over-education.

In the UK, Groot and Brink (1997) researched degree and returns to educational mismatch. The major contribution of this study was regarding the endogeneity of schooling when estimating over-education. To measure the returns to education, they estimate three different models. First is the conventional approach of Ordinary Least Squares [OLS] in which education is treated as an exogenous variable. Secondly, the model involves the use of Instrumental Variables to account for the endogeneity of educational mismatch. Thirdly, the researcher estimated an ordered probit model in order to correct for sample selection bias. Another study done by Alpin et al. (1998) used two measures of educational mismatch, that were an objective and a self-assessment method measure. It found a 27% incidence of over-education in British graduate workers. A study by Dolton and Vignoles (2000) in the UK used a self-assessment, subjective job requirement method which found 30% as the incidence of overeducation. The value of numerous subjective and objective measures has been discussed widely in the literature (Cohn & Kahn, 1995; Chavelier, 2000; Hartog, 2000), Groot and Brink (2000) established that the definition assumed within this analysis has little or no impact when estimating either the incidence of, or returns to, educational mismatch.

In Portugal, there was a study done by Kiker et al. (1997) which used a three measure method of educational mismatch, which was a subjective method, objective method and

realised matches method. The incidence of over-education was 29.4%, 25.5%, and 30.1% respectively.

In Canada, a study done by Vahey (2000) used self-assessment; workers were asked about their level of educational attainment and were asked to rate them against the educational requirements of their work. This study has considered a wages equation in which required, over, and under-education are dummy variables. Also, this study did not find that over-educated employees receive lower wages than adequately educated ones. It has also found that returns to educational mismatch are sensitive to gender and the educational requirements of the employee.

In Australia, a study by Voon and Miller (2005) studied the consequences of educational mismatch on wages. This study used the realised matching method to calculate job role educational requirements. It found that over-education is higher among men than women while under-education is higher among women. With regard to the impact of mismatch on wages, workers who are over-educated receive a modest payoff for the years of over-education. In contrast, those who are under-educated are paid less compared to those who are adequately educated.

In less developed countries, limited studies have been published on educational mismatch. For example, Quinn and Rubb (2006) discussed the effect of educational career mismatch on wages and the productivity labour market in Mexico to estimate returns on wages. Required education was measured by calculating the mode of years of education for all people in a specific sector. The findings were matched with those of developed countries. This study suggested that policymakers should not only focus on consideration to increase educational attainment level in the country but also increase the professional level in order to optimise the use of human capital stock in the country. Another study by Abbas (2008) who estimated the incidence of education-career mismatch and the returns to educational mismatch. This study uses the realised matches technique to estimate required education. Major findings agree with the results from developed countries as over-education has been found to have positive returns whereas under-education has negative returns. Also, the returns to over-education are lower compared to returns to required education. Table 2-2 gives a brief summary of the previous empirical works on educational mismatch.

Table 2-2 Empirical Evidence of educational mismatch

Developed countries	US	Duncan & Hoffman (1981) Subjective	Rumberger (1987) Subjective	Verdugo & Verdugo (1989) Objective
	UK	Groot & Brink (1997) 3 different models	Alpin, Shackleton & Walsh (1998) Objective & Subjective	Dolton & Vignoles (2000) Subjective
	Portugal	Kiker, Santos & De Oliveira, (1997) 3 different models		
	Canada	Vahey (2000) Subjective		
	Australia	Voon & Miller (2005) Realised matching method (a statistical method)		
	Poland	Kiersztyn (2013) Objective		
Less developed countries	Mexico	Quinn & Rubb (2006) Realised matching method (a statistical method)		
	Pakistan	Abbas (2008) Realised matching method (a statistical method)		
	Tunisia	Nadia Zrelli Ben Hamida (2014) Subjective		
	Egypt	Nada Bedir (2014) Realised matching method (a statistical method)		

Source: Author's work

A limited number of studies have been conducted about skills mismatch in the developed country such as the UK, Netherlands, and Australia. All of them used a subjective measure. In the UK, McGuinness & Sloane (2011) established that 15% of the sample surveyed are over-skilled on average (33% in a primary job and 14% in a current job), although, it was higher for men than for women, at 18% and 12% respectively. Green and McIntosh (2007) reported higher over-skill levels (35–53%). In the Netherlands, Allen and van der Velden (2001) found that 49% of the sample survey in the labour market of the Netherlands were under-skilled. In Australia, a study by Mavromaras et al. (2013) found that severe and moderate over-skill stood

at approximately 14% and 30%, respectively. Empirical evidence refutes this scenario, as over-education appears to be a permanent feature of the economy. Moreover, a large proportion of educationally mismatched workers tends to remain in a mismatched situation (Groot & van den Brink 2000). Table 2-3 summarizes the empirical studies on skills mismatch in developed economies.

Table 2-3 Empirical Evidence of skills mismatch

Developed countries	UK	<ul style="list-style-type: none"> • Green & McIntosh (2007) • Belfield (2010) • McGuinness & Sloane (2010) 	Subjective Subjective Subjective
	Netherlands	<ul style="list-style-type: none"> • Allen & van der Velden (2001) 	Subjective
	Australia	<ul style="list-style-type: none"> • Mavromaras et al. (2009) • Mavromaras et al. (2010) 	Subjective Subjective

Source: Author's work

2.6 Determinants of Educational mismatch and Skills mismatch

The previous section examines the incidence of educational mismatch and Skills mismatch, which raises the issue of what factors drive mismatch in the labour market. This research explores some potential explanations while bearing in mind the theoretical discussion. The discussion focuses on individual characteristics (gender, educational background, age and ability and skills, job characteristics and firm size).

2.6.1 Gender and Marital status

The theory of differential educational mismatch identifies the space-gender relationship in the job matching procedure. However, when it comes to empirical evidence, the hypothesis that a woman is more likely to be overeducated than a man has only received limited support. Using the 1985 Panel Study of Income Dynamics (PSID), McGoldrick and Robst (1996) established no significant relationship between labour market size and the likelihood of married women being overeducated. The risk of educational mismatch instead depends on the measure of educational mismatch used, with the probability of educational mismatch for married women increasing with the subjective method and dropping for married men using the statistical (mean) method. Büchel and Battu (2003), in their study in Germany, found that labour market size leads to a significant role in determining educational mismatch among married women. Specifically, being a married woman increases the chances of being in an overeducated job qualified to be unmarried women or men (married and unmarried), which is particularly evident in rural areas. However, when the commuting distance is considered, it turns out that married men and women (the magnitude of the effect is larger for women) living in rural areas have a higher risk of an educational mismatch.

Büchel and van Ham (2003) also focus on the significance of space, however, they do not focus on the gender dimension. The authors argue that the size of the labour market is critical in determining employment opportunities and depends on what they call “commuting tolerance” (i.e., the maximum time a worker is willing to commute for a job). They, therefore, assume that access to an individual motor vehicle or a shorter journey to a larger labour market will increase the opportunity of finding a good job match. Using the German panel data (GSOEP), they established that individuals who owned cars for personal use and individuals with a shorter commuting time to a large accumulation had a reduced risk of an educational mismatch. However, Büchel and Battu (2003), also for Germany, exposed that the longer distance between the place of job and place of residence, the higher probability of being employed in a well-matched job. This positive impact of commuting tolerance might reflect the fact that Büchel and Battu (2003) focused on married respondents whereas Büchel and van Ham (2003) focused on a general sample.

There is very little evidence regarding the relationship between gender and skills mismatch. Green and McIntosh (2007) for the UK, and Mavromaras et al. (2009) for Australia establish no evidence that skills mismatch is higher for women. Green and McIntosh (2007) did discover

though that married respondents have a reduced risk of skills mismatch relative to single respondents, although this finding was statistically significant for a graduate sample.

2.6.2 Educational attainment

The relationship between educational attainment and educational mismatch is generally hypothesised as positive, partly because of the way educational mismatch is measured. For example, educational mismatch cannot exist for the lowliest educated. However, the empirical evidence does not fully support this argument. On the one hand, some researchers discovered that the probability of educational mismatch increases with the levels of educational attainment (Wirz and Atukere, 2004; and Frenette, 2004). For instance, Wirz and Atukeren (2004) show that individuals with a university degree run a higher risk of an educational mismatch as compared to individuals with non-university qualifications. In Canada, Frenette (2004) reveals that individuals with a master's degree from three different cohorts (1982, 1986 and 1990) were more likely to be educationally mismatched than those with a bachelor's degree. Other researchers instead point out that the greater the qualifications, the lower the probability of educational mismatch (Dolton and Vignoles, 2000; Cuttillo and Di Pietro, 2006; Di Pietro and Cuttillo, 2006; McGuinness and Bennett, 2007; Robst, 1997, 2007). Robst (2007) in the USA established that the probability of being mismatched is lower for individuals with master's or doctoral degrees than for bachelor's degree holders. Cuttillo and Di Pietro (2006), in a study of the Italian labour market, indicate that graduates with postgraduate qualifications are more likely to be in well-matched jobs than those with other qualifications. Postgraduate qualifications may provide graduates with additional skills that are valued by employers. This argument is in line with the predictions in the job competition model and signalling theory whereby individuals with greater educational attainment are more likely to be hired because they have the required skills.

Turning to skills mismatch, Mavromaras et al. (2009) established that the risk of skills mismatch, particularly severe skills mismatch, is less prominent among individuals with higher levels of education. The risk of severe skills mismatch is reduced by approximately 30% each for those with a certificate/diploma and degree or higher compared to the reference group (no certification or qualifications).

2.6.3 Field of Education

A vast literature finds that educational mismatch is more prevalent for graduates in general fields of education (arts and humanities, social sciences and language), while those with specific job-related education (medicine, accounting, engineering and architecture) have a reduced risk of an educational mismatch. This is not surprising since some degrees provide graduates with very specific skills to achieve very specific jobs. Those who major in specific and vocational degrees are possibly more highly in demand in the labour market compared to those with a general education. McGuinness (2003), using a UK graduate sample, found strong evidence that maths, engineering, and medicine graduates, among other groups (consisting mostly of architecture and mass communication graduates) are less likely to have an educational mismatch in their current job as opposed to social science graduates. Similar results were also found by Green and McIntosh (2007) and Dolton and Silles (2008), both in the UK.

2.6.4 Age, work experience and training

A key insight of human capital theory is that a trade-off exists between education and other human capital variables such as work experience or training. It is possible that educational mismatch reflects deficiencies in other types of human capital cumulation and there is also strong support for what has been termed the ‘substitutability hypothesis’, in which work experience (sometimes proxied by age) and training are negatively correlated with the probability of educational mismatch (Sloane et al., 1996, 1999; Kiker et al., 1997; Daly et al., 2000; Büchel and Pollmann-Schultz, 2004; Pietro and Cutillo, 2006; Green and McIntosh, 2007) and skills mismatch (Green and McIntosh, 2007; Mavromaras et al., 2009). For instance, Green and McIntosh (2007) established that being one year older reduces the probability of educational mismatch and skills mismatch by almost 5% and 6% respectively among graduates. Büchel and Pollmann-Schultz (2004), in a study of the German labour market, found that for each number of training sessions attended, the risk of employees having an educational mismatch is reduced by 25%. The conclusion of a significant and negative relationship between experience or age and training and the incidence of educational mismatch or skills mismatch suggests that educational mismatch and skills mismatch incidence may feature in the early stage of an individual’s career.

2.6.5 Ability and Skills

Individuals are heterogeneous in terms of skills and ability, while educational mismatch employees are in some way less able relative to their well-matched counterparts. However, this is difficult to establish empirically. Green, McIntosh and Vignoles, (1999) have dealt with individual heterogeneity by proxying abilities and skills via controls for a numeracy test. Using the National Child Development Study (NCDS) dataset, they established that individuals who score higher on the mathematics test mean that educational mismatch is less likely than for individuals with a lower score. Green and McIntosh (2007) also established that UK graduates with good mathematics scores at GSCE and A-level have a reduced risk of educational mismatch and skills mismatch. In the case of A-level, better scores for graduates in mathematics reduce the risk of educational mismatch and skills mismatch by 13 to 16 percentage points as compared to those with lower scores.

Chevalier (2003) in the UK controlled for individual heterogeneity by classifying educational mismatch employees into two groups based on job satisfaction: genuine and apparent educational mismatch. This is because, within educational mismatch workers, individuals may have different characteristics or unobserved heterogeneity which varies from one educationally mismatched employee to another. Using a multinomial logit regression, he established evidence that the risk of apparent educational mismatch is lower than the probability of genuine educational mismatch across a range of variables including type of study, qualifications and A-level score. For instance, relative to economics graduates (base group), education graduates are about 6 and 19 percentage points less likely to be genuinely and apparently educational mismatched, respectively. Furthermore, those with a teaching qualification (PGCE) are 21 percentage points less likely to be apparently (genuinely) educationally mismatched. Similar results are evident for those with PhD and professional qualifications.

Another approach is to make an allowance for individuals' skills to perform the job. Chevalier and Lindley (2009) in the UK measured two types of individual skills: academic skills (written and spoken communication, foreign language, numerical, basic computer, research skills, etc.) and professional skills (entrepreneurial, teamwork, leadership or management skills). They contend that within educational mismatch employees, there are heterogeneous aspects. They found that the probability of being apparently and genuinely educational mismatched is contingent upon an individual's academic or professional skills. Their findings reveal that academic skills have no significant effect in determining educational mismatch, apart from writing skills, which increase the probability of apparent educational mismatch by 9 percentage

points. In contrast, professional skills management and leadership skills were found to reduce significantly the possibility of genuine educational mismatch, by around 6 and 11 percentage points respectively.

2.6.6 Job characteristics

Employees in part-time employment have a higher educational mismatch (they may for a variety of reasons be more concerned with gaining employment irrespective of match quality) as found in Di Pietro and Cutillo, (2006) Green and McIntosh, (2007) Dolton and Silles (2008), for Italy and the UK respectively. It was found that the probability of being educationally mismatched among full-time working graduates is 11% points lower compared to part-time employed graduates.

General agreement in the probability of educational mismatch is negatively related to the respondent's occupational level, particularly evident in the case of graduates. This stems from the fact that many professional and managerial occupations require greater competence which may only be possible with having a degree level education. Di Pietro and Cutillo (2006), establish for Italy that graduates employed in the managerial and professional occupations have a reduced risk of educational mismatch by 32% and 48%, respectively. Also, using alumni data, Dolton and Silles (2008) establish that UK graduates in traditional graduate positions, such as managers, professionals and associate professionals, were less likely to be educationally mismatched compared to other occupations.

The findings are similar concerning skills mismatch. Mavromaras (2009) found in Australia some evidence indicating employees in lower-level jobs have an increased risk of skills mismatch compared to employees in higher- or middle-level jobs.

2.6.7 Firm size

Empirical evidence consistently indicates that firm size is associated with the risk of an educational mismatch. As firm size increases, it boosts the probability of employees being employed in well-matched jobs (Sloane, P. J, Battu & Seaman, 1999; Di Pietro & Cutillo, 2006; Green & McIntosh, 2007; P. J. Dolton & Silles, 2008). Di Pietro and Cutillo (2006) established that graduates in the Italian labour market have a lower educational mismatch risk if they work in firms with more than 100 employees compared to firms with fewer than 100 employees. Similarly, Green and McIntosh (2007) explain that the risk of educational mismatch is significantly much lower for employees in firms with more than 1,000 employees relative to smaller firms. This phenomenon perhaps occurs because larger firms tend to have more

professional human resource management policies and to some extent, educational mismatch job applicants may be rejected at the outset.

However, the effect of firm size on occupation match is empirically unclear with regard to skill. On the one hand, Green and McIntosh (2007) found evidence that the likelihood of skills mismatch among graduates decreases with firm size. Relative to firms with less than 25 employees, graduates employed in firms with 500 to 999 and more than 1,000 employees had a reduced risk of skills mismatch by 12.7% and 13.2%, respectively. On the other hand, Mavromaras et al. (2009) found that the risk of severe skills mismatch for employees falls by 16% at firm sizes of 10–19 employees as compared to workers at firms with more than 50 employees, although in general, the probability of skills mismatch does not increase linearly with firm size. Conceivably, employers find it much easier to see the education level of applicants, but their skills may not be fully observed. Once individuals are hired, they are matched in terms of education while they may be mismatched in terms of skills (Zakariya, 2012).

2.7 Education mismatch and job satisfaction

In general, job satisfaction is a psychological concept which is commonly used in (employment and organisational) psychology (e.g. Spector, 1997). Freeman (1978) is believed to be the first who introduced such a variable into the economic domain. Research has recommended that education is an important variable in conditioning the types of expectations employees bring to the workplace and, commonly, highly educated employees seem more satisfied than their lower educated counterparts because a higher level of education leads to a better job position and more job autonomy (Clark & Oswald, 1996; Verhofstadt, Buysse, Devoldre, & De Corte, 2007). However, if this expectation is not fulfilled, highly educated workers tend to be dissatisfied with their work.

Quality of match has been recognised as a key determinant of job satisfaction in empirical research (Tsang, 1987; Hersch, 1995; Battu, Belfield, & Sloane, 2000; Johnson & Johnson, 2000; Fleming & Kler, 2008), although the mechanism through which this operates is unclear. Overall, at least two theoretical mechanisms are at play, first, direct effect from autonomy. Mun C. Tsang & Levin (1985) established a model in which educational mismatch relates to job satisfaction and quit intentions. In this model, overqualified employees have lower job satisfaction because more educated employees set a higher priority on a job that is challenging and provides them with autonomy. When employees are placed in positions in which their education is underutilised, the degree of challenge and autonomy of the job does not match

their expectations or requirements, which subsequently results in lower job satisfaction. As work effort and productivity are positively related to job satisfaction, educational mismatch employees are less productive. Second, strong evidence shows that educational mismatch employees earn significantly lower wages than their co-workers who have similar educational attainment but work in well-matched jobs. These lower earnings could lead to lower job satisfaction for the educational mismatch (Fleming & Kler, 2008).

To test the Tsang and Levin (T&L) model, Tsang (1987) used data from Bell communication companies and found that educational mismatch resulted in lower job satisfaction. Specifically, additional years of surplus education resulted in a nearly 12% fall in job satisfaction. In a subsequent study, Tsang, Mun and Rumberger. (1991), using data from the 1969 Survey of Working Conditions, found similar effects where educational mismatch employees were 8 to 13% more likely to be dissatisfied in their jobs as compared to well-matched employees, with women having the highest percentage. Hersch, (1991), using a sample from employees of 18 manufacturing and warehouse firms in Oregon, found similar effects where the educational mismatched was up to 4% less likely to be satisfied with their jobs than the well-matched workers. Battu, Belfield and Sloane, (2000), Belfield and Harris (2002), Verhaest and Omey (2006; 2009) and Vila, Garcia-Aracil, and Mora, (2007) used aggregate data in analysing the relationship between educational mismatch and job satisfaction. Using a graduate sample from a British university, Battu et al. (2000) revealed that job satisfaction was higher among adequately educated employees than educational mismatch graduates. According to the authors, this may be because educational mismatch graduates feel they have fewer promotion prospects than the adequately educated, or employers refuse to upgrade their tasks. Verhaest and Omey (2006; 2009), using Belgian school leavers' data, revealed that educationally mismatched employees are 7 to 11% less satisfied with their job as compared to adequately educated employees across four educational mismatch measures.

In a study of college majors and job satisfaction, Vila et al. (2007) investigated the effects of educational mismatch on job satisfaction amongst young European graduates ages 26 to 35 across Italy, Spain, Austria, Germany, the Netherlands, the United Kingdom and Sweden. Using data from the 1999 Careers after Higher Education-A European Research Survey (CHEERS), the study reveals that job satisfaction amongst graduates increase when they are able to use their academic qualifications. Educational mismatch graduates are by far less satisfied with their jobs.

Nevertheless, a few studies have established no effects. Allen and van der Velden (2001) found no evidence that educational mismatch graduates in the Netherlands are more likely to be dissatisfied than well-matched employees do. Rather, they found that the skills mismatch has lower job satisfaction (Büchel (2002), using a German firm sample, found no evidence of a relationship between job satisfaction and educational mismatch. Instead, the author finds that the educational mismatch is healthier, are more job and career-minded, have more on-the-job training and have longer tenure than their adequately educated counterparts. However, the sample here is confined only to those working in low-skilled jobs requiring few formal qualifications.

The important deficiency of these studies is that they only analyse the effects of educational mismatch on general job satisfaction. This raises the question of whether the educational mismatch is dissatisfied with other characteristics of the job. A few authors have examined the multidimensional nature of job satisfaction (Johnson & Johnson, 2000; Wolniak & Pascarella, 2005; Fleming & Kler, 2008; and Peiró, Agut, & Grau, 2010).

Using data from the 1993 American Postal Workers Union, Johnson and Johnson (2000) examined the effects of perceived educational mismatch on various dimensions of job satisfaction including satisfaction with job, supervision, promotion and pay in two periods. Their results indicate that not all aspects of jobs are unsatisfactory to the educational mismatch. the educational mismatch is significantly associated with lower job satisfaction with pay and promotion, and there is no evidence the educationally mismatched have lower job satisfaction with respect to job and supervision. Wolniak and Pascarella (2005) examined the relationship between satisfaction and the quality of job match amongst graduates on intrinsic (job autonomy and personal fulfilment) and extrinsic (financial characteristics of the job) aspects. Using data from 30 private and public colleges in the Appalachian Region, US, they established that graduates employed in jobs that did not correspond to their college major were dissatisfied with personal fulfilment and financial rewards, but this had no effect on satisfaction with autonomy.

Peiró et al. (2010) in Spain explored the relationships between educational mismatch and the three facets of job satisfaction (extrinsic, intrinsic and social satisfaction) using hierarchical regression analyses. Based on 643 young Spanish employees, they established in general that a negative relationship exists between educational mismatch and the three aspects of satisfaction. The magnitude of the effects is larger for extrinsic satisfaction than the other aspects. Fleming and Kler (2008) used the 2001 Australian HILDA survey and found that the educational mismatch is unhappier compared to non-educational mismatch employees in terms

of general job satisfaction and satisfaction with pay, job security, job flexibility, kind of job and working hours.

2.8 Education mismatch and job mobility, on-the-job search

Individuals can respond to their mismatch by investing in additional training to compensate for other kinds of human capital deficiencies, i.e.- job experience and training, hoping that once they accumulate enough experience and training, they will be promoted into a job commensurate with their education. For this, Sicherman, (1991) studied career mobility amongst the educational mismatch in the US using two successive surveys (1976, 1978) of the Panel Study of Income Dynamics (PSID). The author's conclusions designated that educational mismatch employees have a higher probability of moving to higher-level occupations via external mobility (mobility between firms) compared to the adequately matched. Moreover, Alba-Ramirez (1993) in Spain investigated whether educationally mismatched employees were likely to change their employers. Using a logit model, the author found that such employees were more likely to change their firms than their adequately educated peers. These results imply that educational mismatch employees lead to a higher turnover rate at the firm level. Hersch (1995) for the US and Groeneveld and Hartog (2004) for the Netherlands found that educational mismatch considerably develops the likelihood of job promotion within firms. In particular, Hersch (1995), using the 1991 survey data of employees from a private firm in a Wyoming-regulated industry, found that educational mismatch employees in their first job with their current firm experienced an increased probability of promotion. Groeneveld and Hartog (2004), using a sample from an energy and telecommunications company for the period 1995–1998, found that educational mismatch significantly develops the possibility of an internal job promotion.

Wolbers (2003) maintains that job mismatch can also be minimised by looking for another job whilst still employed, or so-called on-the-job search. On-the-job search activity can be described as the cognitive process of thinking, planning, and desiring to leave a present job and looking for another job whilst still employed (Mobley, Griffeth, Hand, & Meglino, 1979; Weisberg & Kirschenbaum, 1993; Purani & Sahadev, 2008). Such activity seems more appropriate for educationally mismatched employees because it provides them with better access to labour market information whilst still employed. Using data from the 2000 European Union Labour Force Survey (EU LFS), Wolbers (2003) examined on-the-job search behaviour among educational mismatch employees across 13 European countries. The author determined that the educational mismatch is 33 to 65% more likely to look for another job whilst working

compared well-matched employees. The author suggests that dissatisfaction among the educationally mismatched provides an incentive for them to change jobs to obtain a position that matches their education and skills. In a study of the Canadian labour market, Wald (2005) determined similar results: graduates who are an educational mismatch for their jobs are 7 to 15% more likely to look for another job than their counterparts who are in well-matched jobs.

A few studies also establish a significant relationship between educational mismatch and on-the-job search (Mavromaras, McGuinness, O'Leary, Sloane, & Wei, 2013). Di Pietro & Urwin (2006), establish that educational mismatch employees in Italy are more likely to be engaged in on-the-job search activity than well-matched employees (Henseke & Green, 2016). The magnitude of effects is much greater for the educational mismatch; however, this suggests that the educational mismatch is relatively more desperate to change jobs than well-matched employees. García-Mainar, García-Martín and Montuenga (2015) establish contradictory evidence for the Netherlands, where educational mismatch graduates are less likely to seek alternative employment whilst employed compared to their well-matched counterparts. Instead, they establish that skilled mismatch employees are more likely to search for another job whilst on the job relative to those who are well matched in terms of skills.

2.9 Libyan Constructions sector: an overview

This section provides an overview of the Libyan construction sector. The last half-century saw Libya shift from a predominantly agricultural economy to one based on industry, construction and trade, achieving in different sectors at a faster rate than its North African counterparts (World Bank, 2015). These changes have contributed to and have occurred alongside significant changes in the nature of the labour market. At least three major changes can be observed; a growing number of women participating in the labour market, the overall increase in demand and supply of skilled workers, and the rise of mismatched employment among highly-educated employees. (World Bank, 2015)

Oil and gas extraction dominates Libya's economy. This sector contributed approximately 54 % of gross domestic product (GDP) in 2010 but decreased during 2012-2013 because of political instability (Elaokali, 2012). The second largest sector was construction sector by 8.7 %, real estate and professional activities by 7.1 %, and manufacturing by 6.9 %.

Therefore, the construction sector could be one important solution to decrease the dependency on oil for income away from oil and promotes the diversification policy. To do so, it is

important to increase the share of this sector in GDP through improving the quality of employability policy and direct domestic/foreign investments in construction.

Libya has experienced a substantial economic growth rate over the past few decades, which has resulted in a dramatic change in the labour force profile. The transformation of the economy has brought about rapid evolution in the numbers of the national labour force, and that the structure and size of the labour force have changed between economic sectors.

Table 2-4 shows the distribution of labour in the Libyan economy by sector, and it is clear that the public sector absorbed the majority of labour during 1973-2012. The percentage of workers in this sector ranged between 37.4% in 1973 and 64.85% in 1984, in 1995 it was 56.06%. Afterwards, in 2006, this proportion increased to 63.63 %, and to 78.4% in 2012. Further, the financing, insurance, real estate and business services sector was the smaller sector, where the proportion of workers in this sector in 1973 did not exceed 1.28% of the total. At its highest in 2012, this sector accounted for 2.3%.

The proportion of workers in the business and construction sector ranged between 7.82% in 1973 and 2.08% in 1984, while in 1995 it was 1.89%. Afterwards, in 2006 this proportion had increased to 2.41 %, while in 2012 it had decreased to 1.61%.

While estimations cannot predict the future precisely, they can signal directions and complement other labour market information. In the same context, with no clear long-term directions, the extent of this variation in ratios from year to year can be ascribed to several factors, including (Elaokali, 2012):

- The low rate of illiteracy among males due to continuous improvement in education;
- Increased reliance on the oil industry since 1973, which has led to emerging new jobs and new skills;
- Volatility in the rates of dependence on foreign labour due to instability in Libyan development plans;
- The fight for power and political instability has influenced the situation of the market, exchange rates, standard of living and job chances.

Table 2-4 Economically active Libyan population (15-64) by sector of economic activity from 1964 to 2012 (percentage %)

Type of industry	1973	1984	1995	2006	2012
Agriculture, hunting, forestry and fishing	23.9	10.0	9.5	8.9	0.8
Mining and quarrying	2.1	1.7	2.2	2.6	1.2
Manufacturing industries	3.2	5.2	8.4	3.5	4.4
Electricity, Gas and Water	2.1	1.6	3.4	3.0	2.5
Building and Constructions	7.8	2.1	1.9	2.4	1.6
Wholesale and retail trade	8.0	6.7	9.0	7.9	4.8
Transport, Storage and Telecommunications	10.6	6.5	6.9	4.8	4.6
Financing, Insurance, Real Estate and Business Services	1.3	1.3	2.2	2.2	2.4
Public Services	37.4	64.9	56.1	63.6	76.5
Activities not adequately described	3.5	0.4	0.5	1.0	1.2
Total	100.0	100.0	100.0	100.0	100.0

Sources: Author's work based on data from

- 1- General Information Authority- Libya
- 2- Bureau Statistics and Census in Libya.

2.1 Summary

This chapter reviews the empirical literature regarding the incidence, determinants and effect of mismatch on individuals and from the firm's perspective. This literature review primarily intends to provide the foundations for a mismatch study in the labour market. Two types of mismatch are commonly examined in the literature: educational mismatch and skills mismatch and both are quite different. Whereas educational mismatch focuses on the education required for a job, skills mismatch highlights skills that the job requires. Between the two, educational mismatch has received the most attention in the literature because its measures are more available in the dataset as compared with skills mismatch. With respect to incidence, on average educational mismatch ranges from 5 to 54% while skills mismatch ranges between 15 and 53%. The variations in both incidences are partly due to different datasets, countries and years of study, as well as to differences in mismatch measurement, particularly for the educational mismatch. Although objective and subjective methods tend to estimate higher incidence, the statistical measure is likely to generate a lower figure. With regard to cause, mismatch incidences are not only influenced by individuals' human capital endowment, but also by other elements such as heterogeneity in skills, ability and talent, as well as space and workplace characteristics. The importance of workplace characteristics on mismatching determinants gains little attention compared to other elements. In terms of consequences, although educational mismatch and skills mismatch are two different concepts, they have similar impacts on individuals, as the mismatch definitely reduces individual productivity by lowering earnings and job satisfaction. Additionally, educational mismatch leads to on-the-job search behaviour. Although the subject is little studied, the evidence suggests a negative externality regarding the presence of a mismatch in the workplace on firm performance, as it increases quit rates and lowers average pay. The study of educational mismatch and skills mismatch and its outcomes have been well-documented in the literature. Little evidence has been offered from developing countries' perspective except for earnings outcomes. Mehta, Felipe, Quising and Camingue (2011) mentioned that mismatch could have different normative implications if it is established in developing economies where incomes are low, education levels are rising fast from a low base and the quality of education is highly variable. To fill this gap, this study explores educational mismatch and skills mismatch together with their consequences in Libya, focusing on the construction sector.

Chapter 3 Research methodology

3.1 Introduction

Chapter 2 has provided a literature review on the educational and skills mismatch with labour market requirements and human capital theory, job competition theory, career mobility theory, assignment theory and empirical evidence of educational and skills mismatch. The orientation towards this particular area was mainly due to the need for deep understanding about the educational and skills mismatch of graduates. In general, research can be conducted for two purposes. One is to measure the phenomenon of educational and skills mismatch of the graduates, the other is to contribute to the general body of knowledge in a particular area of research. and this is called basic or fundamental research (Sekaran, 2003). Based on the above classifications, this study falls within basic research, because it aims to understand more about educational, skills mismatch and labour market requirements.

This chapter aims to explain the research philosophy and design that has been employed by this research. More specifically, this chapter is structured as follows: it starts with a brief discussion of the research philosophies and the selected methodology. This is followed by an explanation of the research design. It then describes the research population and sampling procedures. This is followed by a description of the data collection methods, questionnaire construction and pre-testing, the content of the final draft of the questionnaire, features of the covering letter, the targeted respondents and survey administration a response profile. Finally, the chapter ends with a discussion of the statistical methods used in this research.

3.2 Research philosophy

It is significant to conduct any research based on principles of methodology. According to Collis and Hussey (2003), researchers should limit their research paradigm before constructing the research design. This limitation has significant effects for research methodology. Before describing the detailed research philosophies, it is significant to distinguish between research techniques and design. Oppenheim (1992) suggests that research techniques are methods for data collection. The research design is concerned with the plan of the research, and the logic behind it, which will make it possible to draw general conclusions. The research design is a significant choice and has a major role to play in the whole research (Collis & Hussey, 2003). Furthermore, Creswell (2012) contends that a researcher should choose the research design as a primary step in the research because research design includes: (1) research methodology, (2)

data collection methods, and (3) data analysis and interpretation methods. According to Easterby-Smith, Thorpe and Lowe (2002), understanding the philosophical subjects of research is useful for several reasons:

- It can help the researcher to know the suitable design for the research.
- It can support the illustration of the research design.
- It can assist the researcher to classify and build designs that may be outside the researcher's past knowledge.

Paradigms are defined as the improvement of methodical practice based on people's attitudes and hypotheses about the world and the nature of knowledge (Collis & Hussey, 2003). Paradigms offer an outline including a believed set of theories, methods and ways of defining data. According to Easterby-Smith, Thorpe and Lowe. (2002), there are two main research philosophies or paradigms; positivistic and social constructionism. The implications of both philosophies are shown in Table 3-1.

Table 3-1 Implications of positivism and social constructionism

	Positivism	Social Constructionism
The observer	Must be independent	Is part of what is being observed
Human interest	Should be irrelevant	Are the main drivers of science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation Research
Research progress through	Hypotheses and deductions	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to simplest terms	May include the complexity of the whole situation
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reasons

Source: Easterby-Smith, Thorpe, & Lowe (2002) & Zuriekat (2005)

Different expressions have been used in describing research paradigms. Table 3.2 summarises the most popular expressions for the main research paradigms.

Table 3-2 Alternative terms for the research paradigms

Positivistic paradigm	Phenomenological paradigm
Quantitative	Qualitative
Objectivist	Subjective
Scientific	Humanistic
Experimentalist	Interpretive

Source: Collis & Hussey (2003) & Zuriekat (2005)

Collis and Hussey (2003) state that the most common expressions through writers are quantitative and qualitative. They also suggest that the choice of either paradigm is specified by actual knowledge of the topic under search, and the research objectives. Moreover, both paradigms have a significant part to play in business and social research (Saunders, Lewis, & Thornhill, 2009). According to Amaratunga, Baldry, Sarshar and Newton (2002), the quantitative approach searches for causal explanations and fundamental laws and mostly decreases the whole to the simplest possible components in order to simplify it. In comparison, the qualitative approach is used to inductively and holistically understand human experiences in the context-specific setting. The quantitative model tends to relate variables in hypotheses, by using statistical procedures. The results may assert or confirm the theory (Collis & Hussey, 2003). On the other hand, the qualitative model requests clear information about the phenomena under investigation, which is then examined in its wider case over time (Creswell 2012). Furthermore, debates exist about the approaches, knowledge requirements and methods which all participate in three approaches to research. These approaches are quantitative, qualitative and mixed. The following are the definitions for each approach as specified by Creswell (2012):

- A quantitative method is one in which the researcher firstly uses post-positivism for improving knowledge, utilises approaches to investigation such as experiments and collects data on predetermined tools that give outputs of statistical data.
- A qualitative method is one in which the enquirer often draws on knowledge based on constructivist perspectives for improving knowledge, utilises approaches such as case

studies, and collects open-ended data and emerging data with the primary intent of improving themes from the data.

- A mixed method is one in which the researcher tends to base knowledge required, utilises approaches and collects data. The final database represents both quantitative and qualitative information.

The research philosophies have indispensable expectations and implications regarding how research should be managed Creswell (2012). Overall, defining the most appropriate philosophy is an ongoing debate among researchers (Easterby-Smith, Thorpe, & Lowe, 2002). Consequently, understanding the strengths and weaknesses of both paradigms provides researchers with perceptive aspects to their research position. Instances of the strengths and weaknesses of the quantitative and qualitative paradigms are presented in Table 3-3.

Table 3-3 Strengths and weaknesses of research schools

Theme	Strengths	Weaknesses
<p>Positivist (quantitative paradigm)</p>	<ul style="list-style-type: none"> • They can provide wide coverage of the range of situation. • They can be fast and economical. • Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions. 	<ul style="list-style-type: none"> • The methods used tend to be rather inflexible and artificial. • They are not very effective in understanding processes or the significance that people attach to actions. • They are not very helpful in generating theories. • Because they focus on what is, or what has been recent, they make it hard for policymakers to infer what changes and actions should take place in the future.
<p>Phenomenological (qualitative paradigm)</p>	<ul style="list-style-type: none"> • Data-gathering methods seen as natural and as artificial. • Ability to look at change processes over time. • Ability to understand people's meaning. • Ability to adjust to new issues and ideas as they emerge. • Contribute to theory generation. 	<ul style="list-style-type: none"> • Data collection can be tedious and require more resources. • Analysis and interpretation of data may be more difficult • Harder to control the pace, progress and end-points of the research process. • Policy makers may give low credibility to ideas resulting from a qualitative approach.

Source: Amaratunga, Baldry, Sarshar, & Newton (2002)

Adopting the quantitative (positivistic) paradigm in general leads to the use of the deductive approach with particular research methodologies such as longitudinal research, cross-sectional research and surveys. On the other hand, adopting the qualitative (phenomenological) paradigm mostly leads to the use of the inductive approach with research methodologies such as case studies. Previously, Creswell (2004) recommended several criteria for determining the appropriate research approach to adopt. Dependent on these criteria, Saunders, Lewis and Thornhill (2009) contend that the most significant of these are:

- The research topic. A topic that assists in developing a theoretical framework and hypotheses leading to a reasonable approach. It may be more suitable to assume the inductive approach for research into a new topic with little current literature.
- Audience preferences. Most are familiar with the deductive approach and are much more likely to put faith in conclusions resulting from this approach.
- Time available to the researcher. The deductive research can be quicker to complete. On the other hand, inductive research can be much more protracted. Therefore, the deductive approach can be a lower-risk strategy than the inductive approach.

Based on the criteria above, this research has adopted a quantitative (positivistic) paradigm in its design to achieve the research objectives, and to provide a foundation for generalising the results. This leads to the adoption of a research methodology that uses quantitative methods of data collection. In this case, Collis and Hussey (2003) contend that the controlling paradigm in business research is the positivistic paradigm, and consequently, researchers who use it do not have to spend time justifying this methodology. On the other hand, the phenomenological paradigm may require more time for researchers to justify the methodology. In addition to the Collis and Hussey (2003) argument, the following justifications support the selected philosophy for this research:

- Most human capital theory research has been conducted by adopting a quantitative research philosophy in design to examine the expected relationships between contingent variables and educational and skills mismatch of individuals: for example, Lacey and Luff (2009), Sicherman and Galor (1990), Dickens and Lang (1988), Sweetland (1996) and Khan et al. (2008).
- Several empirical studies have been carried out by adopting a quantitative philosophy in their design to explore the expected relationships that might emerge from the interaction between the contingent variables and educational and skills mismatch of individuals: for instance, Halaby (1994), Sloane (2014), Di Pietro and Urwin (2006), Bartlett (2013) and Sloane (2014).
- In many countries, human capital theory researchers build their databases to overcome resistance to gathering data. Therefore, researchers have often obtained data through surveys (Freeman, 1976). In addition, labour market researchers collect their own data, contrary to economic researchers. Thus, labour market researchers tend to choose surveys (Verhaest & Omey, 2006).
- The literature review on educational and skills mismatch has revealed that there is a need to conduct research surveys because many of these studies have tended to be concerned

with conducting case studies or forwarding theoretical arguments. Bejaković and Mrnjavac (2014), Sloane (2014) and Budrića and Moro-Egido (2014).

3.3 Research design

It was argued in the previous section that choosing a certain research paradigm leads researchers to implement a specific research design. The extent of scientific rigour in research depends on how far the researchers choose an appropriate design. According to Sekaran, (2003) there are several points to consider within research design. These are; (1) the purpose of the research, (2) the type of investigation, (3) the extent of researcher interference with the research, (4) the research setting, (5) the unit of analysis, and (6) the time horizon.

➤ **Purposes of the study**

The objective of this research can be classified as descriptive. This type of research relies on its objectives (Cooper & Schindler, 2006). The main aim of descriptive research is to describe the characteristics of the variables (Sekaran, 2003). The aim of this research is to investigate the level of education and skill matching of university graduates to the Libyan construction labour market. Consequently, this part of the research can be classified as descriptive research, which influences the research objective to examine the effects of level of education and skill matching on an individual's income, career prospects, workplace satisfaction and behaviour.

➤ **Type of investigation**

Research might be correlational or causal. Correlational research is interested in the association between variables while causality research deals with cause-and-effect relationships. Based on the former point, and consistent with the research objectives, this research is classified as causal research.

➤ **The researcher's involvement with the research**

Sekaran, (2003) specified that there could be varying degrees of researcher involvement in the manipulation and control of variables. Furthermore, Sekaran, (2003) stressed that most individual problems call for causal research. In this research, no attempt will be made by the researcher to manipulate the research variables.

➤ **The research setting**

Researchers can be classified as laboratory or field researchers. Laboratory research is usually conducted in an artificial environment. On the other hand, field research is conducted in the real environmental circumstances. This research is therefore classified as field research because it was conducted in the real situation.

➤ **The identity of analysis**

The identity of analysis indicates the level of grouping of the data collected during the

subsequent data analysis such as individuals, groups or institutions (Collis & Hussey 2003).

Research might be longitudinal or cross-sectional. In longitudinal research, data are collected at more than one point in time, while in cross-sectional research, data are collected once, which may be over a period of days or weeks. Cross-sectional research often uses the survey method (Easterby-Smith, Thorpe, & Lowe, 2002). This research has been managed at one point in time, so it is cross-sectional or one-shot research.

3.4 Research population

The term population indicates the total group of people, events, or things of benefit under study, and the population scope is a listing of all the elements in the population from which the sample is pulled Sekaran, (2003). The population for this research is defined as graduates from universities who recently or are currently working in the construction sector in Libya. The rationale for targeting the construction sector in Libya is as follows:

- This research restricts the sample to graduates from universities who recently or are currently working in the construction sector to implicitly control a large number of confounding variables that can substantially affect any results from graduates.
- The construction sector is more relevant and clearly reflects the constructs of this research and its variables: this is particularly important since the surveys here contain different sub-groups; such as employees in sub-companies, etc.
- The response rates for each of the graduate years indicate a reasonable level of response, and the data can be considered to be of a standard which makes it reliable for robust analyses.
- The dataset includes a large number of responses. This is valuable to the analyses to be conducted in the chapters which follow, due to the methodology used, which seeks disaggregation of the sample into very detailed groups.
- The descriptive statistics specify that the types and characteristics of the sample are proportionate with those predicted of a graduate population. The dataset can, consequently, be considered to be credible for analysis.

3.5 Sample and sampling frame

After defining the population, it is necessary to identify a suitable sample and a suitable sampling frame. Choosing a sample is an essential element of positivist research (Collis &

Hussey 2003). The main reasons for sampling are lower cost, better reliability, and better speed of data collection and the availability of population elements (Cooper & Schindler, 2006). The sampling frame for any sample is a whole list of the positions in the population from which the sample will be drawn (Cooper & Schindler, 2006). A first, it was necessary to define suitable criteria to be used to choose the sample for the research. Of special interest to this point was the identification of the database. Different databases were available in Libya for setting the sample frame. These were the Ministry of Higher Education and data from official organisations in Libya such as the General Information Authority and the Bureau of Statistics and Census. The first database considered was the Ministry of Higher Education database. It listed 7,875 members who had graduated from different universities. It contained information relating to the number of new graduates, subject title, university of graduation, email address and mobile number. The limitations of this database were that information related only to employees in the private sector. An effort was made to shorten the Ministry of Higher Education database to meet the criteria.

The second database was that of official institutions in Libya such as the General Information Authority and the Bureau of Statistics and Census.

This database contained information relating to the labour force and economic data for Libya. According to the criteria for selecting the sampling frame of this research, the General Information Authority, the Bureau of Statistics and the Census database consisted of 800 graduates from universities who had recently or were currently working in the construction sector in Libya. The need for an appropriately large number of graduates resulted in the exclusion of graduates in small cities with an unstable situation at this time.

Based on the standard selected for defining the sampling structure and because no appropriate list exists to collect the sampling structure (Saunders et al., 2009), it was decided to use the General Information Authority, the Bureau of Statistics and Census database for identifying the research sampling structure. Furthermore, the need to obtain data from graduates from universities resulted in the need to use the Ministry of Higher Education database for providing information on the selected sample. After defining the sampling structure, it was necessary to select the sampling method and the sample size. A quota sample method is used because this approach is useful when time is limited, a sampling frame is not available, the research budget is very tight or detailed accuracy is not important. These are all the case in this study. Quota sampling refers to selection with controls, ensuring that specified numbers (quotas) are obtained from each specified population subgroup (e.g. households or persons classified by relevant characteristics), but with essentially no randomization of unit

selection within the subgroups. No population list is used, but a quota, usually based on census data, is drawn up, such as in this case (Elder, 2009).

A sample size of graduates from universities was selected from the Bureau of Statistics and Census database. The reason for choosing a large sample was to obtain an adequate response rate and to guarantee that the sample was representative of the whole population. This is consistent with Saunders et al. (2009) and Cooper and Schindler (2006), who argue that it is significant to choose a large sample size to ensure substantial confidence in the data.

The research population, sampling framework and data collection methods are also considered in this chapter, followed by a justification for selecting the Libyan university graduates. Specifically, the sampling frame was based on the data from the General Information Authority, Bureau of Statistics and Census database existing of 800 graduates from universities who have recently, or and currently, working in the construction sector in Libya. The need for an appropriately large number of graduates resulted in the exclusion of graduates in small cities with an unstable situation at this time. This procedure shortened the list to 260 graduates who have recently, or and currently, working in the construction sector in Libya.

3.6 Data collection methods

Data collection methods are an integral part of the research design. These methods have been extensively used in social research (Oppenheim, 1992). The chosen data collection methods impact on the value of the research. The chosen methods should qualify researchers to achieve the objectives of the research. Data can be collected in a diversity of ways, in different structures, and from different resources (Sekaran, 2003). Quantitative methods include methods of telephone surveys, structured questionnaires.

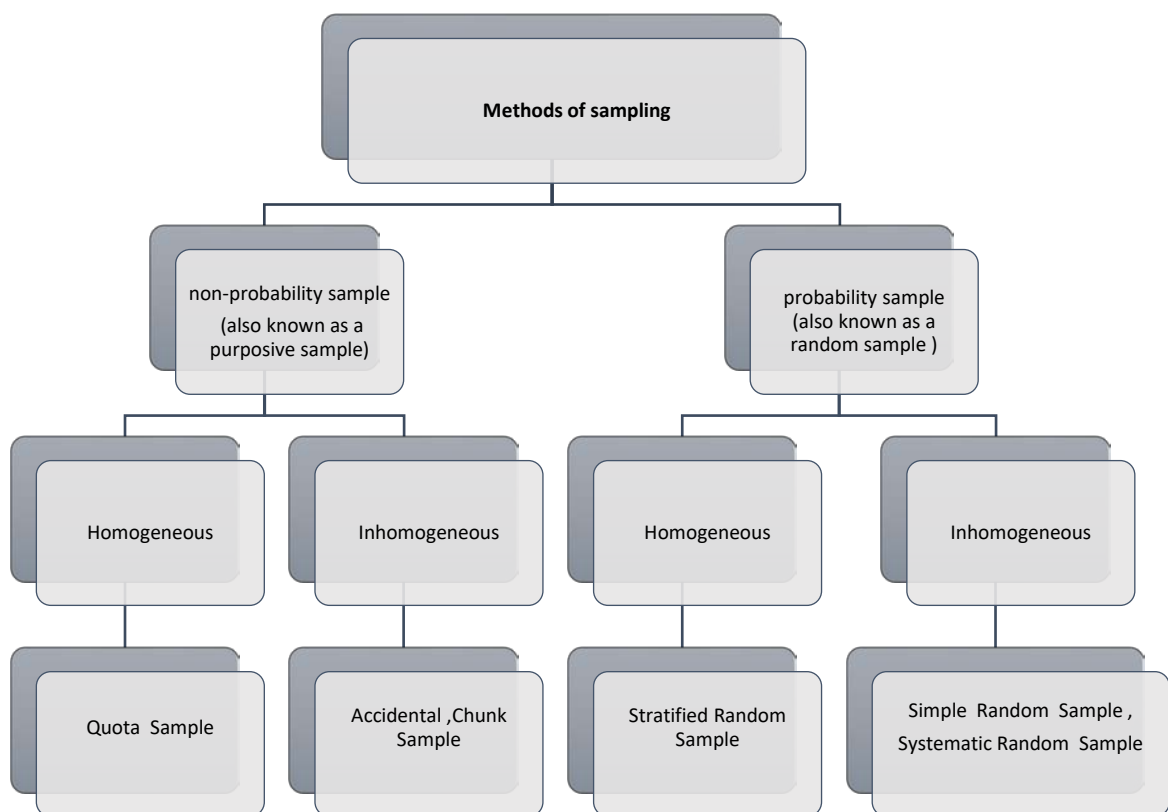
Quota sampling is applied in this research to different faculties' graduates from different universities in Libya. This will be useful if the researcher wishes to be able to make generalisations because it seeks representation of the wider population (Cohen, Manion, & Morrison, 2005). The graduates were requested to complete an online questionnaire by sending the link to their contact addresses. Some hard copy questionnaires were distributed to those who could not fill in the questionnaire online.

The survey was intended to generate a rich source of information regarding Libyan university graduates and link to their experience in the labour market. In particular, the survey contains relevant data about the individual graduate's personal, employment and education characteristics, marital status and other socioeconomic indicators, which are all are important

determinants of labour market outcomes. As these factors are potentially strong predictors of an individual’s participation, attachment, and performance in the labour market, priority should be given to the careful and considered procurement of this information.

Although sampling methods in the social and behavioural sciences are often separated into two groups [probability, purposive], there are actually four broad types, as shown in Figure 3-1.

Purposive sampling methods are primarily used in qualitative research and may be explained as selecting elements [e.g., individuals, groups of individuals, organisations] based on specific purposes associated with answering a research question. Creswell (2012, p. 87) has defined purposive sampling as a kind of sampling in which, ‘‘particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices’’.



Source: (Cohen et al., 2005)

Figure 3-1 Sampling methods

The survey method is usually linked with the positivistic philosophy, and is a common popular method in business research (Saunders et al., 2009). Observations and questionnaires are the three main data collection methods used in survey research (Sekaran, 2003). The options for data collection methods depend on the facilities available, the time span and other costs and resources connected with collecting data (Sekaran, 2003). Questionnaires are used extensively in surveys (Easterby-Smith et al., 2002). Therefore, these two methods are examined in the following sub-sections.

3.7 Questionnaire types and designs

The questionnaire is a list of accurately constructed questions, selected after significant testing to obtain an authoritative response from a sample (Collis & Hussey, 2003). This type of data collection method can be applied to descriptive or explanatory research (Saunders et al., 2009). Questionnaires have the advantage of obtaining data more competently in terms of time and cost (Sekaran, 2003). Furthermore, a questionnaire survey is cheaper and less time consuming than conducting interviews (Collis & Hussey, 2003.) Researchers (e.g. Oppenheim, 1992, Easterby-Smith et al., 2002 and Sekaran, 2003) argue that questionnaires are the most popular method for collecting data and can be managed individually, electronically distributed, or mailed to respondents.

3.7.1 Individually managed questionnaires

The individually managed questionnaire is usually distributable to the respondents by someone in an official position (Oppenheim, 1992). This type of questionnaire takes two forms in terms of the distribution method. The first form is self- managed questionnaires, in which the questioner distributes the questionnaire to the respondent, and then the respondent is left alone to complete the questionnaire. The second form is group- managed questionnaires, which are given to groups of respondents assembled together in order to complete it. The main advantage of personally managed questionnaires is that the researcher collects the completed responses within a short period of time, and any confusing questions can be explained to the respondent (Sekaran, 2003). In contrast, the disadvantages are that institutions may be reluctant to give up company time for the survey with groups of employees assembled for the purpose. It is also an expensive and time-consuming method (Collis & Hussey, 2003).

3.7.2 Mail questionnaires

Mail questionnaires are a commonly used method in collecting data in social sciences (Oppenheim, 1992). The questionnaire and covering letter are posted to the respondents with a prepaid envelope for returning the completed questionnaire. Therefore, this kind of questionnaire can be employed for descriptive research, and for examining and explaining the relationships between variables (Saunders et al., 2009). The advantages of mail questionnaires are that they are most helpful particularly when large numbers of respondents are to be reached in different geographical areas. Furthermore, respondents can take their time to respond at their convenience (Sekaran, 2003). Another major advantage of a mail questionnaire is the low cost of data collection and processing (Cooper & Schindler, 2006). Furthermore, mail questionnaires provide respondents with more confidence regarding their anonymity (Sekaran, 2003). Nevertheless, mail questionnaires suffer from low response rates (Oppenheim, 1999; Collis & Hussey, 2003; Cooper & Schindle (2006). Another disadvantage of the mail questionnaire is that any uncertainty or misleading section cannot be clarified (Sekaran, 2003). In addition, the researcher cannot be sure that the respondents have finished the questionnaire. Finally, there is no supervision over the order in which questions are answered or checks on unfinished questions (Oppenheim, 1992).

3.7.3 Online questionnaires

These types of questionnaires are provided and returned electronically using either e-mail or a web site (Saunders et al., 2009). The online questionnaire has some advantages, including firstly the removal of paper costs and decrease in distribution time. Secondly, the response rate should be increased because the researcher can make direct contact with the respondents. As with the other methods of data collection, this kind of the questionnaire has some disadvantages, such as difficulty in defining the respondent's email address and the problem of anonymity of the respondents. Alternatively, the questionnaire can be advertised on the Internet and respondents invited to access a website to fill in the online questionnaire. As for the email method, this also has disadvantages. Response rates are probably very low and there are major problems of non-response bias (Saunders et al., 2009).

Based on the discussion in this chapter, the survey method was considered more suitable because it provides a significant amount of cross-sectional data necessary for this research. Moreover, an analysis of responses from a large number of graduates would achieve

the objectives of this research. Online questionnaires were therefore considered to be the most appropriate method of data collection for this research.

3.8 Questionnaire construction and pre-testing

In this part of the study process, reviewing the literature identified the objectives of the research and online survey was chosen as the most appropriate method for achieving these objectives.

Developing a suitable questionnaire required a series of measures that would help to achieve the objectives of the research. The basic source for defining the content of the questionnaire was the literature. This main source was specified in order to preserve and maximise the reliability and validity of the questionnaire. Most of the questions applied in this research were adapted from published research.

The literature applies three different approaches to explain educational mismatch: the Worker's Self-assessment [WA], job analysis [JA] and Realised matches method [RM]. This study has used evidence from Libya, using the approach of self-assessment [WA] of graduate employees. This approach is intended to understand and measure the occurrence of the phenomenon of educational, skills mismatch and its effects on career progression. This research has used a quantitative method.

“Quantitative research is explaining phenomena by collecting numerical data that are analysed using mathematically based methods in particular statistics” (Muijs 2004, p3). Quantitative research is particularly suited to discovering the state of something, and also to explaining phenomena.

All of the respondents were contacted through their organisations and social networks to fill in the questionnaire. It was necessary to select the question design to employ closed or open-ended questions. Consequently, the next sub-sections consider in more detail the steps in constructing questions, pre-survey issues and the pilot study.

3.8.1 Question types and design

Question design is connected to the degree of validity and reliability of the research (Saunders et al., 2009), consequently, the major decision to be made at this point related to the kind of questions to be included (Easterby-Smith et al., 2002) . Numerous researchers (e.g. Oppenheim, 1992; Saunders et al., 2009) indicate using guidelines for designing questions. In this circumstance, Sekaran (2003) specifies that there are three significant issues in designing the questionnaire. These are linked to:

- How the variables should be classified, scaled and coded.
- The phrasing of the questions.
- The general appearance of the questionnaire.

Other issues were proposed by Samouel, Money, Babin, and Hair (2003) in which relate to (1) the ideas to be measured should be specified and defined and a method of measurement determined, and (2) decisions on arrangement and outcome information, kinds and phrasing of questions, questionnaire series and layout concluded. Nevertheless, all the suggested guidelines were applied to minimise bias in this research. For instance, the aim of the study was mentioned in the covering letter of the questionnaire.

In addition, efforts were made to use simple and evident questions. The phrasing of each question was carefully considered to provide one possible meaning and to avoid ambiguity.

Questions can be classified in several ways. According to Oppenheim, (1992) questions can be classified into factual and non-factual questions. These are described as follows:

- Factual questions are concerned with details such as a respondent's job title, function of the respondent in the organisation. This kind of question is fundamental to describing the sample and to classifying respondents.
- Non-factual questions are concerned with opinions, beliefs and attitudes. For example, questions relating to the level of education & skills mismatching with job requirements and job satisfaction.

Moreover, questions can be classified into open-ended and closed questions (Saunders et al, 2009) .These are described as follows:

- Open-ended questions: in these kinds of questions the researcher does not provide any group of responses. Instead, the respondents are free to answer in any way they choose.
- Closed questions: In these kinds of questions the respondents mark options through a set of replacements given by the researcher. They help the respondents to make quick choices and the researcher to code the information easily.

The closed questions can be classified into the following types:

- List questions: This kind of question provides to respondents a list of responses, any of which they can select. Such questions are salutary when the researcher needs to ensure that the respondent has considered all possible responses.
- Category questions: This type is designed so that each respondent's answer can fit only one category. Such questions are used to collect data about attributes.

- Ranking questions: This kind of question asks the respondents to place things in rank order. Such questions are applied to discover the relative significance to the respondents.
- Quantity questions: This kind of question asks the respondents the amount of a characteristic and tends to be applied to collect behaviour or attribute data.
- Grid questions: This kind of question qualifies the researcher to record the responses to two or more similar questions during the same period.
- Scale questions: This kind of question is often applied to collect attitude and beliefs data. The most common method is the Likert measure in which the researcher asks the respondents how strongly they agree or disagree.

Among these kinds of questions, some open questions were applied in this research. Also, an open question was applied in section B of the questionnaire to acquire background information about the employed graduates. Open questions were also applied in section C for job information. The reason for employing a limited number of open questions only is that these questions may dishearten respondents from answering the questionnaire (Collis & Hussey, 2003). The main kinds of questions applied in this research were closed questions. The reason for this choice is that these kinds of questions are typically applied in quantitative research employing large-scale surveys (Samouel et al., 2003). Three kinds of closed questions were applied in this research. Firstly, listing questions were applied only in section A about the personal information. Secondly, category questions were used in the last section (C) of the questionnaire. Finally, scale questions were widely applied throughout the questionnaire sections (D, E and F) to measure the research variables.

The classification scale is frequently applied in business research (Sekaran, 2003). According to Collis and Hussey (2003), the Likert scale is one of the more frequently used kinds as it does not require much space and is easy to complete for the respondents. The subject of defining the length of the Likert scale is controversial. In this circumstance, Elmore and Beggs (1975) state that a five-point scale is just as good as any, and that raising numbers from five to seven or nine points on a rating scale does not enhance the reliability of the ratings (quoted in Sekaran, 2003). In the same situation, Oppenheim, (1992) contended that several researchers had applied five points, which permits a larger range of answers to the respondents. Therefore, five-point Likert scales were applied throughout the questionnaire.

3.8.2 Questionnaire layout and flow

Online surveys can often result in a low response rate and a non-response bias (Collis & Hussey, 2003). Major efforts were made to decrease this issue. Methodology researchers

(e.g. Saunders et al, 2009; Sekaran, 2003) have focussed on the design and the inflow as an important part of creating the questionnaire. In this condition, researchers have suggested many guidelines. For instance, Saunders et al. (2009) specified that the design of the questionnaire should be attractive to promote the respondents to fill it in and return it.

The overall rule is to make questionnaires as short as possible. A good questionnaire should involve specific instructions to the respondents, and the questions should be presented in a reasonable order. Sekaran (2003) contended that the method of the questions should simplify the advance of the responses from the start to the end of the questionnaire.

The length of the questionnaire might probably affect the response rate. Eight A4 pages were applied to cover all the research variables. Nevertheless, this is consistent with Saunders et al. (2009), who argue that a good length of questionnaire is between six and eight A4 pages. In this research, the first page consisted of the name of the University followed by the title of the research. The page ended with the name of the researcher and his supervisor.

Another significant issue that should be taken into consideration when designing the questionnaire is the order and flow of questions. The aims of this issue are to make the questionnaire easy to complete and to encourage the respondents (Saunders et al., 2009). Numerous researchers Oppenheim (1992), Saunders et al. (2009) have suggested guidelines for the order of the questions. However, the final choice of method and order must be determined by the research problems, and by the results of the pilot work (Oppenheim, 1992). Each section of the questionnaire consisted of clear orders.

3.8.3 Questionnaire pre-testing and pilot work

Before administering the questionnaire, it was necessary to pilot test the questions. The objective of this step is to improve the questionnaire so that respondents will not have any problems in answering the questions (Oppenheim, 1992). According to Saunders et al. (2009), pre-testing qualifies the researchers to obtain some assessment of the validity of the questions and the probability of the reliability of the data. Pre-testing may include a small number of respondents to test the suitability of the questions and their understanding (Sekaran, 2003). On the other hand, pre-testing may include friends, colleagues and people of several opinions (Collis & Hussey, 2003). Consequently, this research took into consideration the proposals and settled that the best way of testing the questionnaire was based on three stages.

The first phase was presenting the draft questionnaire to five PhD students at the University of Salford School of the Built Environment School. All the students were

undertaking PhD degrees in economics or business. They gave many important comments relating to the phrasing of questions, and most of their comments were taken into consideration. In the second phase, the questionnaire was given to three members of academic staff at the University of Salford School of the Built Environment. Helpful comments were received from the academic staff and resulted in changes to the phrasing and scales of the questions. Furthermore, the researcher's supervisor's comments were also taken into consideration. In the last phase of pre-testing, a copy of the questionnaire was e-mailed to two academic researchers in Libya. Beneficial feedback was received from this group including propositions for changes to the phrasing and measurement of some questions related to educational and skills mismatch.

For the pilot study, the questionnaire was mailed to 10 university graduates from Libya. The questionnaires were addressed to 10 named persons who were asked to participate and complete the questionnaire. In addition, a covering letter was prepared and e-mailed to respondents. They were required to make comments relating to indistinct questions, and propose questions that they thought would be helpful for the research. Moreover, the pilot study also delivered the researcher the chance to check the coding system that has been applied. As a result of this pilot phase, 2 of the 10 questionnaires distributed were returned completed. A reminder message was sent to those who had not responded to the pilot. As a result of this the reminder letter, one questionnaire was returned completed and two were returned uncompleted. At a 15% response rate, it was decided not to send the second reminder. The questionnaire responses suggested that the respondents found the questionnaire easy to complete and understandable. Furthermore, there was no evidence to signal the misunderstanding of the questionnaire items.

In response to the notes received from the pre-testing and pilot stage, changes were made to the questionnaire but without overriding the number of pages or deleting substantial questions. Most of these changes related to framing, layout and development in the clarity of the content.

3.9 The structure of the covering letter

A well-prepared covering letter is necessary to include with the questionnaire. This can encourage respondents to complete the questionnaire correctly. Referring to Collis and Hussey (2003), the objective and context of the questionnaire should be apparent, and this can be achieved by attaching a covering letter, and by starting off the questionnaire with an explanatory paragraph. In this case, Saunders et al. (2009) suggest many guidelines to explain

the objective of the questionnaire by writing a preliminary statement attached to a covering letter. All the suggested guidelines were considered to create a well- prepared cover letter. The covering letter with the final draft of the questionnaire was carefully designed to guarantee that the respondents understood the objectives of the research. The first paragraph of the letter focused on the objective of the research. The second paragraph confirmed the significance of the research to both graduates and the researcher. The third paragraph guaranteed the for the respondents that all the information would be applied only to academic research and would be secure. The fourth paragraph provided information about the supervisor and the researcher. Finally, a signature was provided, showing that the questionnaire was managed personally by the respondent.

3.10 The content of the final draft of the questionnaire

The final draft of the questionnaire was designed to include information about the graduate employees, with specific emphasis on factors influencing their education and skills and job satisfaction. The questionnaire consisted of eight pages, including the front covering page. The first page included the objectives of the research. The questionnaire was divided into six sections based on the research variables.

Section A focuses on the personal information of the respondents and was divided into six questions. (i.e. questions relating to nationality, gender, age, marital status, place of residence and place of work) (see Appendix).

Section B concentrate on the study background of the participants and was divided into nine questions (e.g. University of your certificate, faculty of your certificate, department, academic year of graduation, the general rate at graduation) (see Appendix).

Section C focuses on the work information of the respondents and was divided into 13 questions (e.g. classification by employer type, firm size, Job status, work experience, job title, monthly salary) (see Appendix).

Section D was about the job satisfaction of the respondents and was divided into three questions (see Appendix).

Section E was about the measurement of the level of higher education of the respondents and was divided into five questions (see Appendix).

Section F was about the measurement of the level of level of skill of the respondents, and was divided into three questions (see Appendix).

3.11 Statistical methods applied in data analysis

The analysis and interpretation of any data depends on the objectives of the research and the kind of data generated (Collis & Hussey, 2003). The decision was made to assume the quantitative method to achieve the objectives of the research. It is commonly known that determining suitable statistical methods to analyse data depends mainly on achieving the assumptions of parametric tests. These assumptions, according to Field (2000) and Bryman & Cramer (2001) are:

- The scale of measurement is of equal interval or ratio scaling, that is, more than ordinal.
- The data are from a normally distributed population.
- The variances should not change systematically throughout the data.

Numerous arguments have been advanced by researchers about employing parametric or non-parametric tests. Nevertheless, the need to achieve the above-mentioned assumptions for employing parametric tests have been strongly questioned (Bryman & Cramer, 2001). As far as the first assumptions are concerned, data in this research was collected employing the ordinal scale, and parametric tests employed to such scales. Hair, Money, and Samouel. (2003) argue that in business research, it is suitable to treat the systematic scale as if it were a period. Additionally, parametric tests have been used with ordinal variables and reported in the published economic and labour market education & skill research journals, and have also been applied in previous education and skills mismatching research (Bárcena-Martín, Budría, & Moro-Egido 2012; Battu, Belfield, & Sloane 1999; Carroll & Tani, 2013; Chevalier & Lindley 2009; Li 2013; Lim 2010; Mavromaras, Mcguinness, & O’Leary 2013; Sloane, & Wei 2013 and Trabelsi & Hamida 2015).

A resolution was also made to employ several statistical methods to analyse the data; descriptive statistics (i.e. frequency and mean), reliability test (Cronbach’s Alpha) and correlation and regression. The rationale for employing these statistical methods is presented in the following sub-sections. Further detailed explanations of some of the items in the following sub-sections will be provided in Chapter 4. In addition, the content of the following sub-sections will explain and interpret the statistical findings presented in the subsequent chapters.

3.11.1 Descriptive statistics

Descriptive statistical methods are concerned with presenting, describing and summarising data (Collis & Hussey, 2003). Frequencies and means will be used to describe the

characteristics of the individual respondent graduate employee. In addition, frequencies mean, and mean differences are used to interpret the outputs from the descriptive statistics. Descriptive statistics provide an indication of the shape of the sample distribution which helps in deciding the appropriate analytical statistical method that may be applied to get the research results and make recommendations.

3.11.2 Reliability Test (Cronbach's Alpha)

Reliability analysis studies the properties of measurement scales and the items that build them up. It calculates the number of commonly used measures of scale reliability and also delivers information about the relations between individual items in the scale. A scale with low reliability shows that items making up the scale do not correlate strongly enough, therefore they might not be tapping into the same construct domain. The Cronbach's Alpha (α) reliability test will be used. Cronbach's Alpha (α) is calculated to check the reliability and consistency of the research items and to exclude extreme responses (Hair, Black, Babin, Anderson, & Tatham, 2006). It is based on the rationale that items measuring the same concept will highly correlate (Sharma, 2001; Hair, Black, Babin, Anderson, & Tatham, 2006). Ideally, the alpha coefficient should be greater than 0.7.

The common formula of Cronbach's Alpha is calculated as follows (Cronbach, 1951).

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Where:

- N = the number of items.
- \bar{c} = average covariance between item-pairs.
- \bar{v} = average variance.

Cronbach's Alpha was applied to determine the dimensions of the contingent variables in order to identify the pattern of relationships between these variables. The outcome and decision rules of Cronbach's Alpha are presented in Chapter 4. The reason behind applying this technique is due to the way previous researchers have determined and measured the contingent variables in their research.

3.11.3 Correlation and Regression

3.11.3.1 Bivariate analysis: correlation analysis

Correlation analysis is used to specify if a relationship exists between two variables, as well as the overall strength of the relationship. Notwithstanding the fact that this analysis is a

very helpful research tool, it does not determine which of the variables is the independent and which is the dependent (Kothari, 2004).

Pearson's correlation coefficient is the covariance of the two variables divided by the product of their standard deviations. The form of the definition involves a "product moment", that is, the mean (the first moment about the origin) of the product of the mean-adjusted random variables; hence the modifier product-moment in the name.

Pearson's correlation coefficient when applied to a population is commonly represented by the Greek letter ρ (rho) and may be referred to as the population correlation coefficient or the population Pearson correlation coefficient. Given a pair of random

$$\rho_{XY} = \frac{Cov(X, Y)}{\sigma_X \sigma_Y}$$

- $Cov(X, Y)$ is the covariance
- σ_X is the standard deviation of X
- σ_Y is the standard deviation of Y

3.11.3.2 Multivariate analysis: regression analysis

On the other hand, regression analysis is used to identify the impact of independent variables on the dependent variable. Whereas in simple regression analysis, a single independent variable is used to predict a single dependent variable, multiple regression analysis uses several independent variables to predict a single dependent variable (Cohen et al., 2005). It also identifies how much of the variance in the dependent variable is explained by theorising concurrently the influence of several independent variables. It is considered the most widely used data analysis technique for assessing the relationship between two or more variables (Cohen et al., 2005).

The estimated model is formulated as follows;

$$Jobstatis_i = \beta_0 + \beta_1 Educmis_i + \beta_2 Skillmis_i + \varepsilon_t$$

Where,

$Jobstatis_i$ refers to job satisfaction for individual i

$Educmis_i$ refers to education mismatch for individual i

$Skillmis_i$ refers to skills mismatch for individual i

Base on the above discussion, both correlation and regression types of analysis are employed in the current study to examine the relationship between education and skills mismatch and job

satisfaction among a sample of graduates who are currently working in the construction sector in Libya.

3.12 Summary

The processes of conducting a research project has been clarified and considered in this chapter. The research philosophy and design were clarified and the differences between research models and methodologies were debated. The positivist paradigm using a cross-sectional survey methodology is applied as a convenient method for conducting this research. The research population, sampling framework and data collection methods were also discussed in this chapter, followed by a justification for selecting Libyan university graduates. Specifically, the sampling frame was based on the data from the General Information Authority, Bureau of Statistics and Census database existing of 800 graduates from universities who have recently, or and currently, working in the construction sector in Libya. The main reasons for choosing quota sampling are discussed above. This procedure shortened the list to 260 graduates who had recently, or were currently, working in the construction sector in Libya.

Specified design methods were employed in constructing the questionnaire. Numerous steps were employed for assessing and testing the questionnaire and, in addition, a pilot study was conducted. A total of 187 usable questionnaires were received, representing a 71.9% response rate. This was considered suitable for conducting the statistical analysis. Two other methods of testing for non-response bias were employed in this research. However, no significant differences were established in the two tests, suggesting that the limitation of a non-response bias is unlikely to apply. The issues of reliability and validity were also debated in this research. Finally, a description was provided of the statistical methods employed in this research.

Chapter 4 Empirical results and discussion

4.1 Introduction

This chapter presents the findings of the survey of graduates from universities in Libya. The sample was drawn from four regions located in different areas of Libya, according to the size of each population (as reported in Chapter 3). The questionnaire aimed to gather information on the graduates from universities in Libya's characteristics, and particularly those who have worked in the construction sector recently, between 3-6 years after their graduation, which is the years 2011-2016. Following the descriptive statistics of the sample, the results from the inferential statistics are presented, separated into educational and skills mismatch from the graduates' results. Finally, the results associated with the concepts of education and skills mismatch and job satisfaction are presented.

4.2 Data analyses

The aims and objectives of a study determine the statistical analysis for the research; in this study, the aims are placed to collect data on the studied population. The initial statistical task is to carry out a descriptive study of variables and show findings for the individual variables. The links between the variables and predictive analysis have been investigated with trends and statistical association tests. Various statistical tests are displayed in this work including a graphical method, measures of association and trend detection methods.

4.3 Parametric versus Non-Parametric Tests

Statistical procedures can be split into two parts; parametric and nonparametric tests. Both different tests that were used showed findings in the same direction. The parametric test is described as a test that needs data from a significant range of distributions and there are assumptions that must apply to it for it to qualify as a parametric test. Mismatch returns must be normal for the parametric test to be acceptable and correct. Whereas, nonparametric tests are described by as stronger than the parametric tests opposing outliers. To assess the normality problem in this study, Kolmogorov-Smirnov (K-S) tests were undertaken to see whether the distribution deviated from a normal distribution. The K-S test was used to compare the scores in the sample to normality distributed a set of scores with the same mean and standard deviation. The results of these tests revealed that the data set adhered to normality. Hence, parametric tests were used in this study.

4.4 Statistical technique

Several statistical tests have been used in this study to test and analyses the data collected. Some of the descriptive tests to be used to describe data and are used to show and summarize data in an expressive way as follows:

- A histogram is a graph that represents the number of values, it is applied to graphically summarize and display the distribution of datasets.
- Mean average and standard deviation are applied to analyse the data
- A “Likert item” is a statement that the respondent is asked to evaluate in a survey. It measures attitudes and behaviours using answer choices that range from one extreme to another. In this study, a Likert scale was used to analyse data for questions 29, 30 and 32 in section D.
- Regression equation

This section deals with key education and skills levels that have improved. The value of each factor has been measured by a group of questions that are built on five points of the Likert scale (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree and 5= strongly agree). To determine the length of the cells in the 5-point Likert scale (maximum and minimum limits) the range was studied ($5-1=4$), then divided by the number of scale cells to obtain the correct length of the cell ($4/5= 0.80$). This value was added to the lowest value in the scale (the start of the scale which is 1) to determine the maximum duration for the cell. Table 4-1 indicates that mean items with scores fall between the ranges (Gliem & Gliem, 2003). A t-test is used to investigate whether the level of agreement.

Table 4-1 Likert Scale Interpretation

Point Scale	Mean	Interpretation	Level of agreement
1	$1 < 1.8$	Strongly disagree	Very low
2	$1.8 < 2.6$	Disagree	Low
3	$2.6 < 3.4$	Moderate	Moderate
4	$3.4 < 4.2$	Agree	High
5	$4.2 < 5$	Strongly agree	Very high

Source: Score category breakdown adopted from Joshi, Kale, Chandel, & Pal (2015)

4.5 Descriptive data and sample characteristics

4.5.1 Distribution of Data

It is important to test the nature of data to confirm that it is normally distributed, which helps locate the correct analytical tests to use (Rudestam & Newton, 2014). Skewness measures were applied to test the degree of symmetry of a probability distribution. Where skewness is greater than zero, the distribution is skewed to the right, having more observations on the left. By contrast, if the skewness is less than zero, then the distribution is skewed to the left, having more observations on the right. The data can be considered as normally distributed if the skewness statistic ranges between -1 and +1. Where this range is exceeded, then this would signal that the data is not normally distributed, for statistical study (McQueen & Knussen, 1999).

Kurtosis measures the thickness of the tails of data distribution. If the Kurtosis score is between +1 and -1, this indicates a normal distribution of the data (Oppenheim, 1992). Conversely, when the Kurtosis figure falls outside this range, it suggests the peak and tails vary to suggest a non-normal distribution of the data. The current data was shown to be normally distributed for both Skewness and Kurtosis statistic Table 4-2; thus, data is accepted as normally distributed which, with other parameters, allows for parametric statistics to be used, such as t-tests and coefficient correlation tests. The Skewness and Kurtosis tests indicate that satisfaction, education and skills data sets are normally distributed. This means that multiple regression analysis is an appropriate statistical technique to investigate the association between job satisfaction on one hand and education and skills on the other hand.

Table 4-2 The Skewness and Kurtosis statistic for dependent and independent variables

		Satisfaction	Education	Skills
N	Valid	186	187	187
	Missing	1	0	0
Mean		3.0984	2.9904	3.4112
Median		3.2174	3.2000	3.7000
Std. Deviation		.94069	.70277	1.05021
Skewness		-.390	-.362	-.561
Std. Error of Skewness		.178	.178	.178
Kurtosis		-.720	-.179	-.623
Std. Error of Kurtosis		.355	.354	.354
Minimum		1.00	1.00	1.00
Maximum		5.00	5.00	5.00

Source: SPSS outcomes

4.5.2 Normality test for the data

The null hypothesis of this test is that the population is normally distributed. Thus, on the one hand, if the p-value is less than the chosen alpha level, then the null hypothesis is rejected and there is evidence that the data tested are not normally distributed. On the other hand, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected (e.g., for an alpha level of 0.05, a data set with a p-value of 0.05 rejects the null hypothesis that the data are from a normally distributed population). The results from Table 4-3 show that the null hypothesis is rejected, which means that the data are normally distributed.

Table 4-3 Normality test: Shapiro-Wilk W test for normal data

Variable	Observations	W	V	z	Prob>z
satisfaction	186	0.96883	4.367	3.379	0.36
education	187	0.9873	1.787	1.331	0.091
skills	187	0.9567	6.093	4.144	0.2

Source: SPSS outcomes

4.5.3 Reliability of data

Testing the reliability of data aims to measure the level of consistency between the different responses so that the researcher can be confident in their basis for analysis. Essentially, reliability refers to consistency and can be defined as the extent to which results are consistent over time and an accurate representation of the total population under research is indicated as reliability. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable (Bouma, G. D., & Ling, 2004). Churchill and Peter (1984) suggest that a reliability score of less than 0.60 indicates an unsatisfactory level of internal consistency, whilst a result above 0.60 provides the researcher with greater confidence that data will give the same results if it was repeated. However, Yin (2009) contends that the minimum reasonable scale for the social sciences is 0.70. The result of reliability statistics for the in this study shows that the Cronbach's Alpha for all variables exceeded the minimum requirement which means that it is sensible to conduct analytical tests on the data (Table 4-4).

To ensure the internal reliability of the questionnaires, Cronbach's Alpha tests were applied using the SPSS software program to check for internal reliability. The Cronbach's Alpha values for the reliability of some questions of this questionnaire were high and moderate standard level. A quantitative statistical analysis has been applied to analyse the datasets, starting with Cronbach's alpha test for reliability data (Bland & Altman, 1997).

The reliability of all questions in the study show internal consistency and reliability as the majority of them are above standard agreed measures. They ranged from 0.56 to 0.86 (Bland & Altman, 1997). Table 4-4 shows that the mean average was 0.76 for good internal consistency, which is greater than 0.60 (Kilic, 2016).

Table 4-4 Reliability Statistics: Cronbach's alpha

D. Job satisfaction

The statements	Significance
How satisfied are you with the following aspect of your job?	
Self-satisfaction	0.67
Level of Challenge	0.65
Value Work Experience	0.77
Self-assessment of skills at graduation	
Adaptability	0.68
Problem solving	0.81
Self-confidence	0.69
Self-discipline	0.67
Teamwork	0.83
Communication	0.77
Speak in English	0.82
Write in English	0.56
Information technology	0.69
Numeracy skills	0.68
Self-assessment of skills now	
Adaptability	0.82
Problem solving	0.77
Self-confidence	0.66
Self-discipline	0.78
Teamwork	0.72
Communication	0.84
Speak in English	0.75
Write in English	0.86
Information technology	0.60
Numeracy skills	0.70

E. Measurement of the level of Higher Education

The statements	Significance
To what extent was your programme of study helpful in doing your current job?	0.85
How satisfied are you with the relevance of your study programme? ??present	0.75
The level of workplace	0.67
What is the most appropriate level of education for the work you are doing?	0.69

F. The measurement of the level of skill

The statements	Significance
Your current job offers you sufficient scope to use your knowledge and skills	0.80
You would perform better in your current job if you possessed additional knowledge	0.63
How much they support or inhibit your personal development	
Type of business of the employer	0.82
Level of responsibility	0.69
Level of intelligent Challenge	0.67
Personal attunes easy self-confident	0.78
Foreign language ability	0.77
Level of Numeracy	0.59
Level of literacy	0.79
Technical skills and language	0.81

4.6 Demographic analysis of data and discussions

4.6.1 Personal information

This section aims to survey five different aspects of personal information of the respondents; nationality, gender, age, marital status and region.

4.6.1.1 Nationality

In general, for the participants who responded to this questionnaire (Table 4-5), most of the sample (99%) was Libyan by nationality at 257. However, the remaining 2 participants (1.0%) in this questionnaire who responded to the survey, were non- Libyan.

Table 4-5 Frequency distribution for nationality (Libyan or non-Libyan)

Nationality	Number	Percentage
Libyan	257	99.2
Non-Libyan	2	0.77

4.6.1.2 Gender

The findings in Table 4-6 show that the majority (189) of the respondents to the survey are males, at 73%, and in fact, only 70 of the respondents (27%) who answered this questionnaire are female.

Table 4-6 Frequency distribution for gender (male and female)

Gender	Number	Percentage
Male	189	73.0
Female	70	27.0

4.6.1.3 Age group

The largest portion corresponded to the group older than 30 years old, as shown in Table 4-7, which accounted for 96 of the whole sample (37.1%). This is followed by a number of respondents who answered the questionnaire who were between the age of 20-25, with 87 of 259 with slightly lower than 34% of the total sample. The remaining respondents who answered

the questionnaire were between the age of 20-25: 76 of 259 with slightly higher than 29% of the total sample.

Table 4-7 Frequency distribution for age

Age	Number	Percentage
From 20 to 25 years	87	33.6
From 26 to 30 years	76	29.3
Older than 30 years	96	37.1

4.6.1.4 Marital status

Table 4-8 shows that the majority (151) of the Libyan respondents who answered this questionnaire were single, whereas only 108 of the respondents to this questionnaire were married in this case study. This reflects the fact that about 62% of respondents were aged between 20 and 30 years, whereas the age of marriage tends to be after the age of 30 in Libya.

Table 4-8 Frequency distribution for marital status

Marital status	Number	Percentage
Single	151	58.3
Married	108	41.7

4.6.1.5 Region

It is clear to see that the participants in this questionnaire have come from five different regions, which are the central region, the Tripoli region, the Benghazi region, the Eastern region and the Southern region. In general, the participants were mostly from the central region; more than 170 of the participants who responded were from the central region (Table 4-9). Following that, the next highest (24.7%) group of respondents came from the capital city, Tripoli region. The remaining participants in this questionnaire came from Benghazi, the Eastern and the Southern regions, with small percentages of 3.5%, 2.7% and 1.9%, respectively.

Table 4-9 Frequency distribution for the regions

Region	Number	Percentage
Central Region	174	67.2%
Tripoli Region	64	24.7%
Benghazi Region	9	3.5%
Eastern Region	7	2.7%
Southern Region	5	1.9%

4.6.2 Information about respondents' qualifications

As can be seen in Table 4-10 and Figure 4-1, the largest (67.6%) group of those academic participants who responded to the survey had graduated and held a bachelor's degree. This was followed by 23.6% who have a master's educational level. This result represents the country's level of education. Those who responded and held a higher diploma or a postgraduate diploma only represented a small proportion of participants, with equal percentages of 0.8% and 0.8%. The remaining responses of 7.3% stated that they held a PhD.

Table 4-10 Frequency distribution for education level

Qualification	Number	Percentage
Higher Diploma	2	0.8%
Bachelor's	175	67.6%
Postgraduate Diploma	2	0.8%
Master's	61	23.6%
PhD	19	7.3%

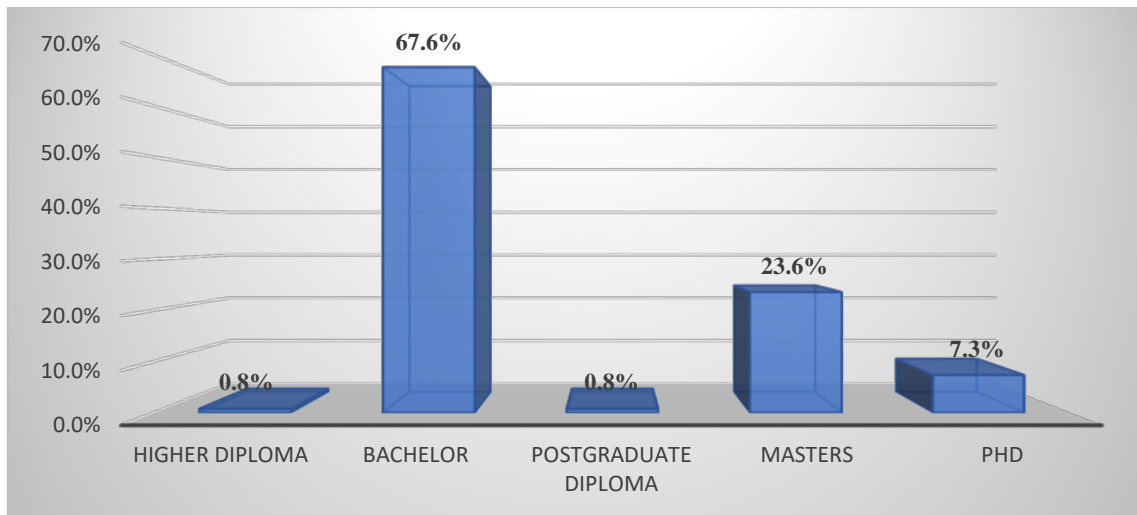


Figure 4-1 Frequency distribution for education level

4.6.2.1 University Certificate

The participants were asked what educational institutions they gained their university certificates from and their responses involved more than 14 different institutions.

Table 4-11 Frequency distribution for a university certificate

University	Number	Percentage
The Libya Academy-Misurata	5	2.2%
The Libya Academy-Tripoli	2	0.9%
Benghazi University	19	8.5%
Alzawia University	6	2.7%
Sebha University	5	2.2%
Almergeb University	12	5.4%
Misurata University	142	63.4%
Omar Al-Mukhtar University	6	2.7%
Almergeb University	12	5.4%
Alnajem Alsatea University	2	0.9%
Aljabl Agarbi University	2	0.9%
Sirt University	4	1.8%
Higher Institute	2	0.9%
International	5	2.2%

As the researcher is based in Misurata, over 60% of the responses to this question came from participants who have a university certificate from the University of Misurata (Table 4.11 and Figure 4-2).

Approximately 8% of the respondents hold a university certificate from Benghazi University and about 5% hold a university certificate from Almergeb University. Many hold a university certificate from universities that are only represented by 1% each of the total participants and these are from The Libya Academy-Tripoli, Average Institute, Alnajem Alsatea University, Aljabl Agarbi University and Higher Institute of Comprehensive Careers Jafra. The Omar Al-Mukhtar University and the Alzawia University were represented by 3% each of participants who hold a university certificate from them. There were about 2% of participants who have international university certificates. The remaining participants have university certificates from the Libya Academy-Misurata and Sebha University, with percentages of 2% each.

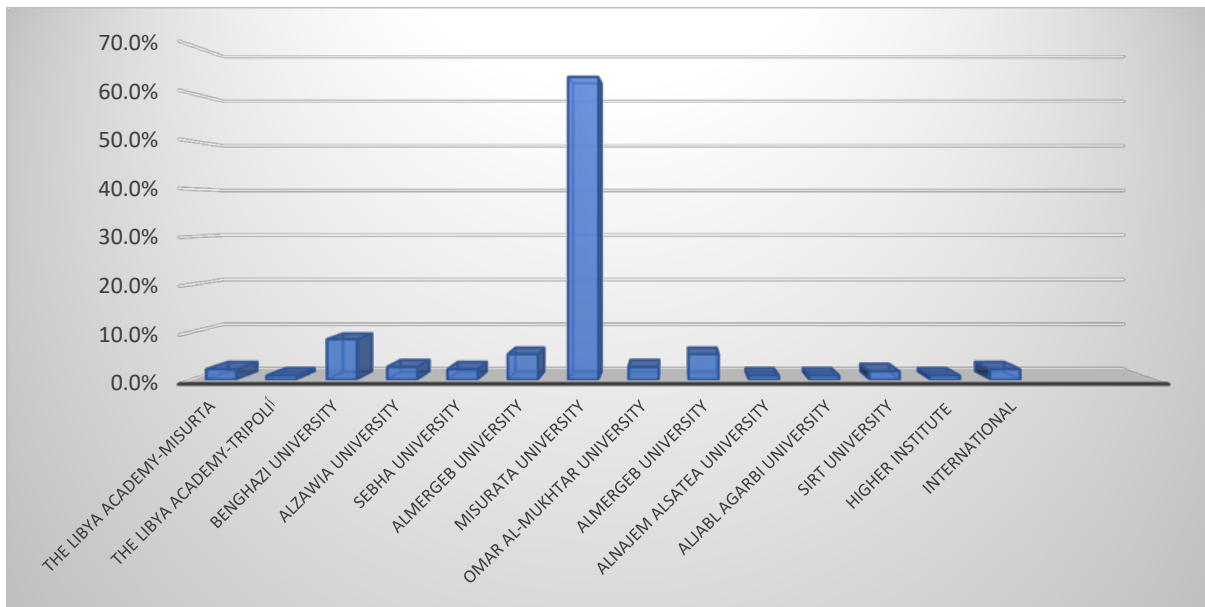


Figure 4-2 Frequency distribution for a university certificate

4.6.2.2 Academic year

It is clear to see that the participants in this questionnaire have come from different academic years, where the oldest graduated in the academic year 1987/1987 and the youngest were in 2010/2018. In general, the participants were mostly (119; with slightly less than 46% of respondents) were graduates of the period between the academic years 2000 and 2009. On the other hand, only 3 of the respondents hold certificates from before the year 1990 (Table 4-12).

Table 4-12 Frequency distribution for academic year

Academic year	Number	Percentage
Before the year 1990	3	1.2%
From 1990 to 1999	83	32.0%
From 2000 to 2009	52	20.1%
From 2010 to 2018	119	45.9%

4.6.2.3 The general rate of graduation

From the Table 4-13, the largest of 97 groups of those academic participants who responded to the survey had graduated with a good degree (slightly less than 38%). This was followed by slightly less than 30% of those academic participants who responded to the survey who hold very good: see Figure 4-3. The best grade of “excellent” was attained by 60 of the respondents to this question (23.3%), where the remaining response of less than 10% held only a pass.

Table 4-13 Frequency distribution for general rate of graduation

Grade	Number	Percentage
Pass	24	9.3%
Good	97	37.6%
Very Good	77	29.8%
Excellent	60	23.3%

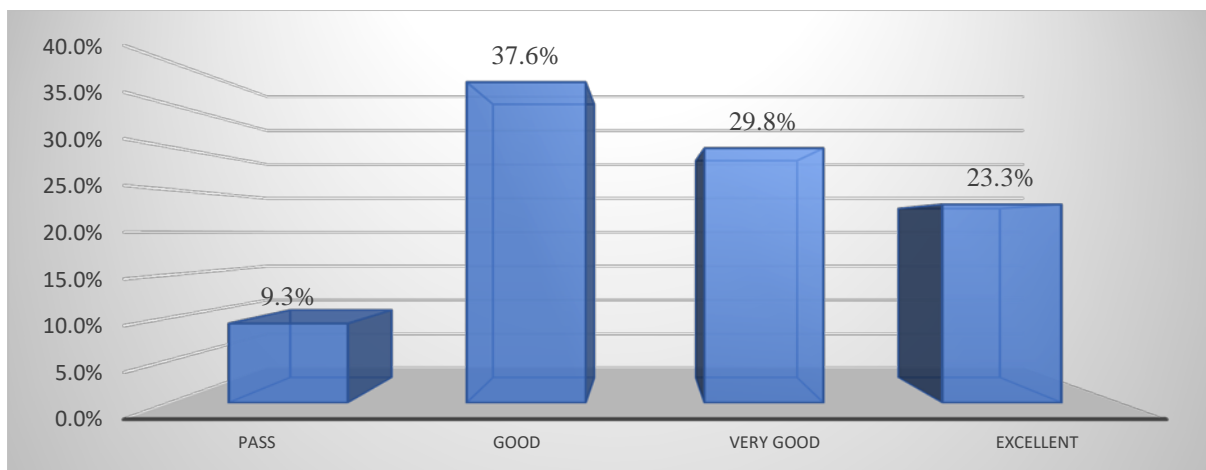


Figure 4-3 Frequency distribution for general rate of graduation

4.6.2.4 Paid work during the final year of study

In this question, participants in the survey were asked if they had done any paid work during their final year of study. More than two thirds (71%) of the participants responded with “no”, leaving the minority of 29%, who had done paid work in their final year of study and replied with “yes” (Table 4-14).

Table 4-14 Frequency distribution for paid work during the final year of study

Paid work during the final year of study	Number	Percentage
Yes	76	29.5%
No	182	70.5%

4.6.2.5 A job in the current period

In this question, the respondents were asked if they currently had a job, and their results are presented in Table 4-15. In contrast with their responses to having a paid job in their final study year, in these responses, more than two thirds (72%) of the participants responded with “yes”, meaning that they currently have a job. This leaves less than 30% of the total participants who said “no”, they do not have a current job.

Table 4-15 Frequency distribution for a job in the current period

A job in the current period	Number	Percentage
Yes	187	72.2%
No	72	27.8%

4.6.2.6 A job with pay after graduation and before the current job

When asked if they had a job with pay after their graduation and before their current job, the participants were almost equal in their opposing responses of “yes” and “no”. Just above half (52%) of the respondents had a job with pay between their graduation and their current job (Table 4-16). Almost equally, 122 (48%) of the total of 254 respondents said they did not get a paid job between the period of their graduation and their current job.

Table 4-16 Frequency distribution for a job with pay after graduation and before the current job

A job with pay after graduation and before the current job	Number	Percentage
Yes	132	52.0%
No	122	48.0%

4.6.3 Work Information

This section of the survey collected information about the working lifestyle of the participants. The first question asked about their type of work, classified by employer context. The classification categories include: facility owned by the community, Libyan company, a foreign company, a private company, self-employed with others and self-employed and with household (Family Business). The highest (58%) proportion of respondents worked for a facility owned by the community (Table 4-17). Following that (17.7%), of participants stated that they were from a private company and an equal number (32) of participants said they were from a Libyan company. The remaining minority said they were self-employed with others, worked in the family business, worked in a foreign company or were self-employed, with percentages of 2.2%, 1.1%, 2.2% and 1.1%, respectively.

Table 4-17 Frequency distribution for work information

Work information	Number	Percentage
Libyan company	34	18.8%
Private Company	32	17.7%
Self-employed with others	6	3.3%
A facility owned by the community	105	58.0%
With household (Family Business)	2	1.1%
Foreign company	4	2.2%
Self-employed	4	2.2%

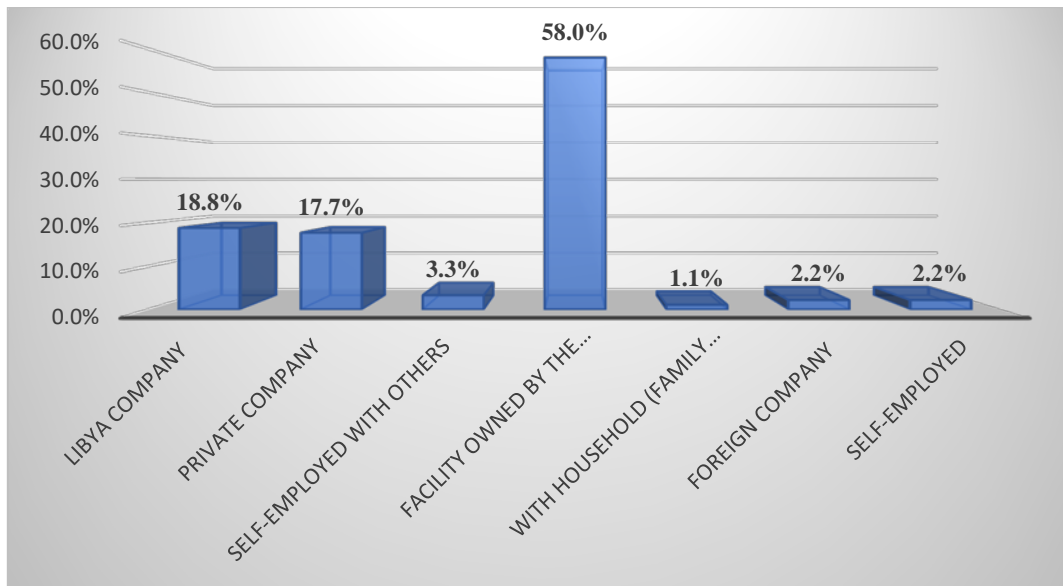


Figure 4-4 Frequency distribution for work information

4.6.3.1 Firm size

In this question, participants were asked about the number of employees in the firm they work for and they were given ranges to pick from to determine the size of their workplaces. Their responses do not show a specific trend, as there are many who come from small workplaces and many who come from large workplaces with more than 500 employees. Respondents from a workplace that has more than 500 employees are represented by 35.3% of the total participants in this survey (Table 4-18 and Figure 4-5). Employees from middle ranges are represented by 24.6% and 18.2% of the total participants and they come from firms that have 26 to 99 employees and firms with 100 to 500 employees respectively. The smallest firms with fewer than 25 employees are represented by 21.9% of respondents.

Table 4-18 Frequency distribution for firm size

Frame size	Number	Percentage
Fewer than 25 employees	41	21.9%
From 26 to 99	46	24.6%
From 100 to 500	34	18.2%
Higher than 500 employees	66	35.3%

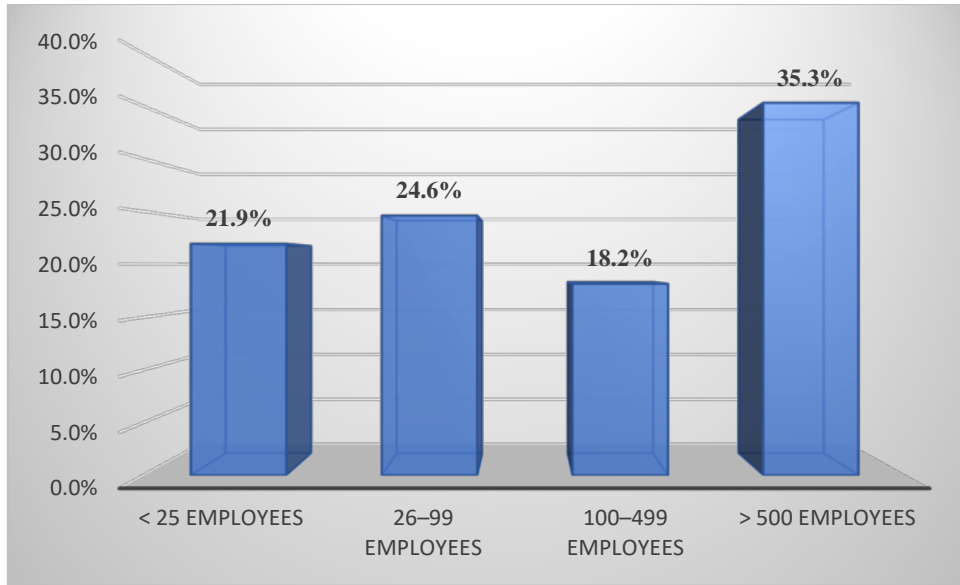


Figure 4-5 Frequency distribution for the firm size of the institution

4.6.3.2 Job status

The respondents shared their job statuses and this information is presented in Table 4-19 and Figure 4-6. Their response show that 70 of the total participants are contracted; these are split into temporary (30) and permanent (40) contracts.

The remaining majority of 117 participants have a job status of “staff” and they represent more than 60% of the total respondents to the survey.

Table 4-19 Frequency distribution for job status

Job status	Number	Percentage
Staffing	117	62.6%
Contract - permanent	40	21.4%
Contract- temporary	30	16.0%

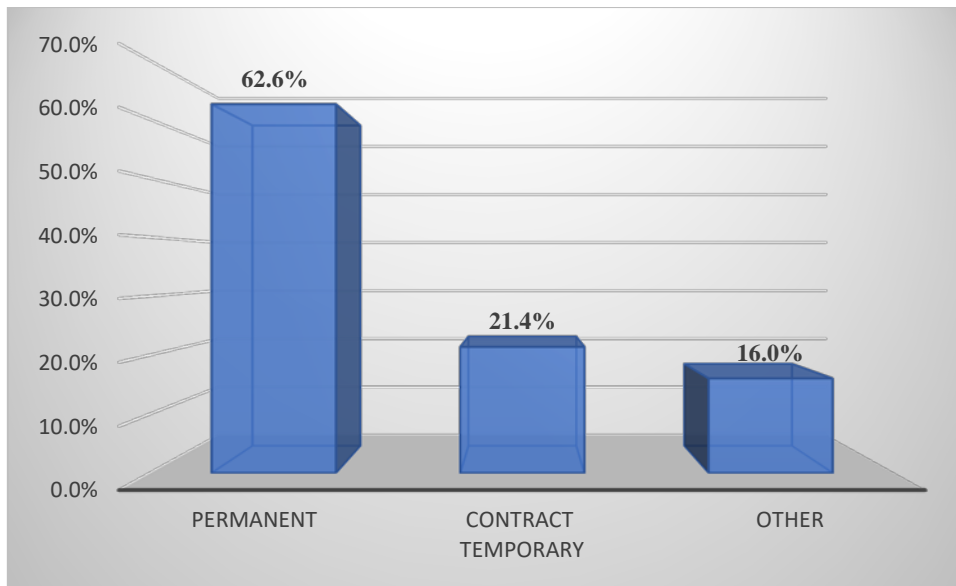


Figure 4-6 Frequency distribution for job status

4.6.3.3 Working years in this job

The respondents to the question about working years in their job (Table 4-20 and Figure 4-7) were relatively homogeneous and symmetrically distributed, where the largest group was repeated once at a frequency of 55 (29.4%) of the total possible frequencies for the statement “from one to three years working”.

Table 4-20 Frequency distribution for the work experience

Years of work experience	Number	Percentage
Less than 1 year	51	27.3%
From 1 to 3 years	55	29.4%
From 3 to 5 years	31	16.6%
More than 5 years	50	26.7%

This is followed by a group of “less than one year” and the group of “higher than five years”, reporting 51 (27.3%) and 50 (26.7%), respectively. The smallest (31; 16.6%) group of participants responded with “from three years to five years”.

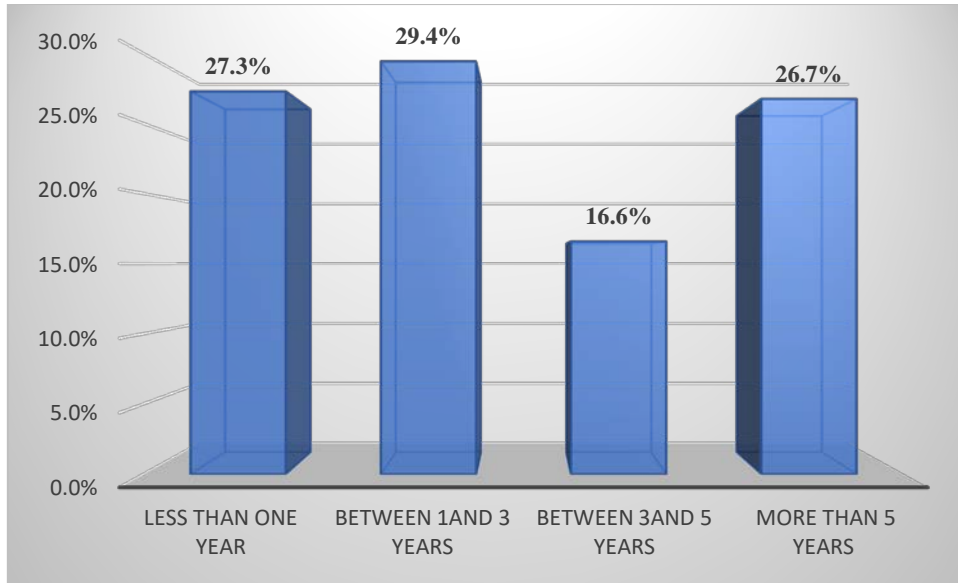


Figure 4-7 Frequency distribution for work experience

4.6.3.4 Job Level

There are three different levels when it comes to classifying job titles and these are upper-level job, medium-level job and low-level job. Amongst the total participants in this survey, just under two thirds (120) have a medium-level job (Table 4-21 and Figure 4-8). Only 18 (9.6%) participants have a low-level job. The remaining participants, almost 50, have an upper-level job.

Table 4-21 Frequency distribution for job level

Job titles	Number	Percentage
Low-level	18	9.6%
Medium-level	120	64.2%
Upper-level	49	26.2%

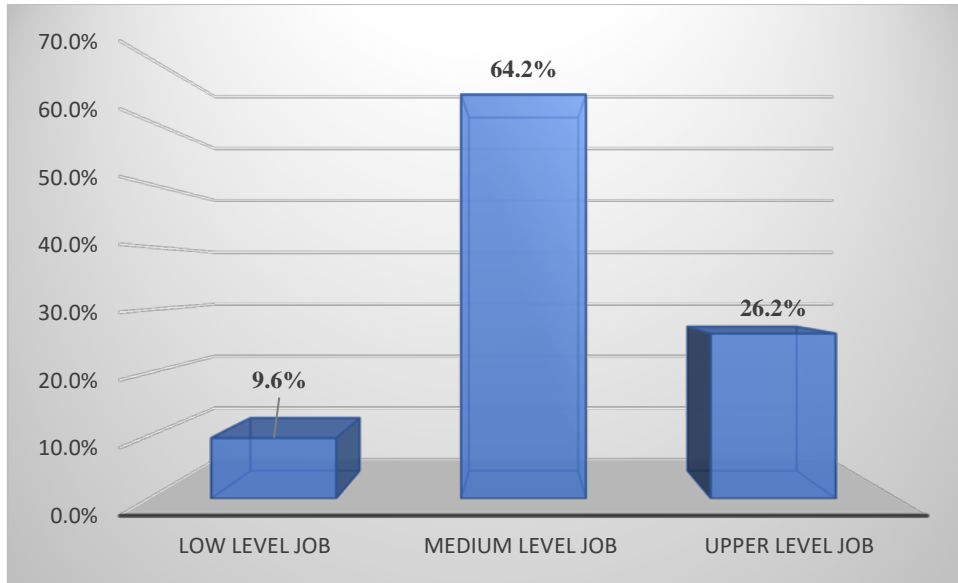


Figure 4-8 Frequency distribution for the job title

4.6.3.5 Monthly Salary

The responses to the question regarding monthly salary (Table 4-22 and Figure 4-9) were relatively homogeneous and symmetrically distributed, with respect of the groups “less than 600 DL” and “from 601 to 800 DL”, these recorded 15 (8.0%) and 56 (29.9%) respectively. The largest group was repeated once at a frequency of 32 (17.1%) of the total possible frequencies for the statement “from 1001 to 1200 DL”. This is followed by a group of from 801 to 1000 DL” (31 N 16.6%) and the group “from 1201 to 2000 DL” (28 N 15.0%). The smallest number (25; N 13.4%) of participants responded with “more than 2000DL”.

Table 4-22 Frequency distribution for a monthly salary

Monthly salary	Number	Percentage
Less than 600 DL	15	8.0%
600-800 DL	56	29.9%
801-1000 DL	31	16.6%
1001-1200 DL	32	17.1%
1201-2000 DL	28	15.0%
More than 2000 DL	25	13.4%

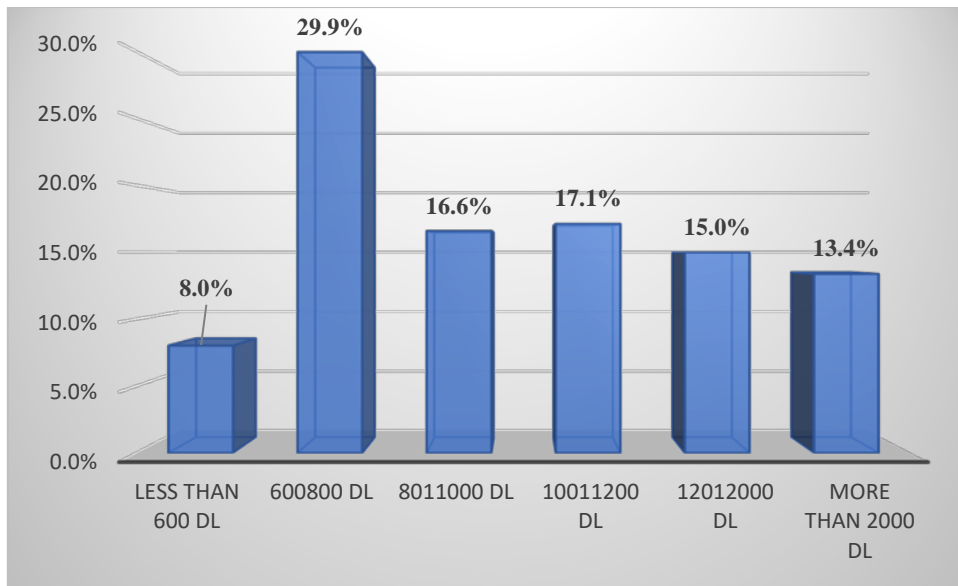


Figure 4-9 Frequency distribution for a monthly salary

4.6.3.6 Getting work

There are six different ways or routes that the respondents are expected to have taken to get to their current job, which are; advertisement, manpower department, networking/family/friends, training centres, sponsorship and finally by work done before further studies. More than half (51.6%) of the participants said they had got their jobs through family and friends networking. Advertisement followed that as the second most popular method of getting a job, as 23.6% of the participants said they obtained their job through advertisement. A total of about 20% of the participants got their job from sponsorships and work they did before studying further (Table 4-23 and Figure 4-10). Only one participant said they got their job through the manpower department. The remaining 6 participants said they got their jobs through training centres.

Table 4-23 Frequency distribution for getting this work

Getting the job	Number	Percentage
Sponsorship	15	8.0%
Advertisement	37	19.8%
Training Centres	6	3.2%
Manpower department	1	0.5%
Networking/family/friends	81	43.3%
Already work before further study	17	9.1%
Other	30	16.0%

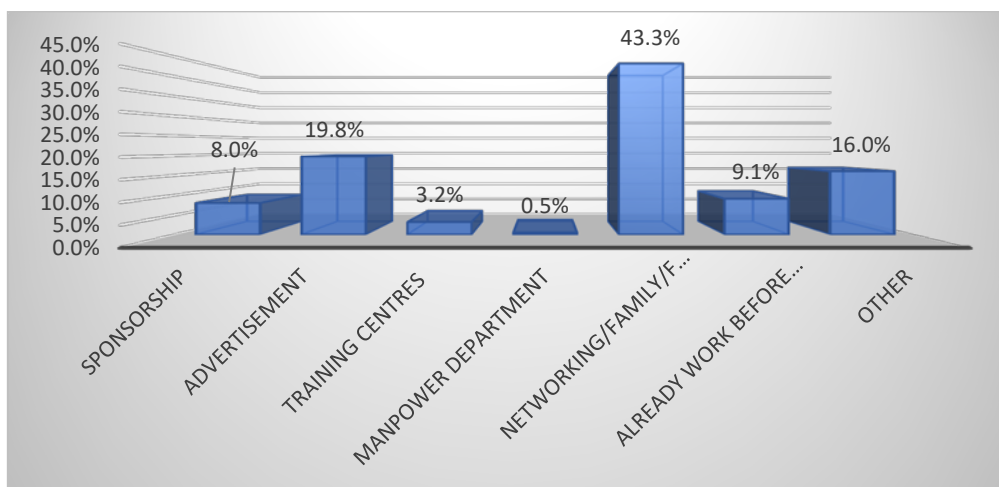


Figure 4-10 Frequency distribution for getting this work

4.6.3.7 Looking for a job

Regardless of their current and past jobs, respondents were asked if they were currently looking for a job, and their responses are presented in Table 4-24. The majority (78.1%) of the participants, responded with “yes”, and only 41 said that they were not currently looking for a job.

Table 4-24 Frequency distribution for looking for a job

Looking for a job	Number	Percentage
Yes	146	78.1%
No	41	21.9%

4.6.3.8 The main reasons for job seeking

The reasons the participants gave for choosing to seek a job are listed in Table 4-25. The reasons were that they were looking for a job compatible with qualifications, aiming to get a higher salary, their current job was not suitable, seeking a job relevant to their field of study, looking for a more challenging job, looking for a permanent position and for social reasons. The highest (40.6%) proportion of respondents to this question were seeking a job for a higher salary (Table 4-25 and Figure 4-11). Following that, 33 participants stated that they were seeking a job which was compatible with their qualifications. Meanwhile, 29 participants (20.3%) stated that they were seeking a job relevant to their field of study.

The least frequently given reason for seeking a job was only given by three respondents and that is that their current job was not suitable.

Table 4-25 Frequency distribution of the reason for job seeking

Getting a job	Number	Percentage
Social reasons	7	3.7%
Current job is not suitable	3	1.6%
Aiming to get a higher salary	58	31.0%
Looking for a more challenging job	13	7.0%
Seeking a job relevant to my field of study	29	15.5%
Looking for a job compatible with my qualifications	33	17.6%
Other	44	23.5%

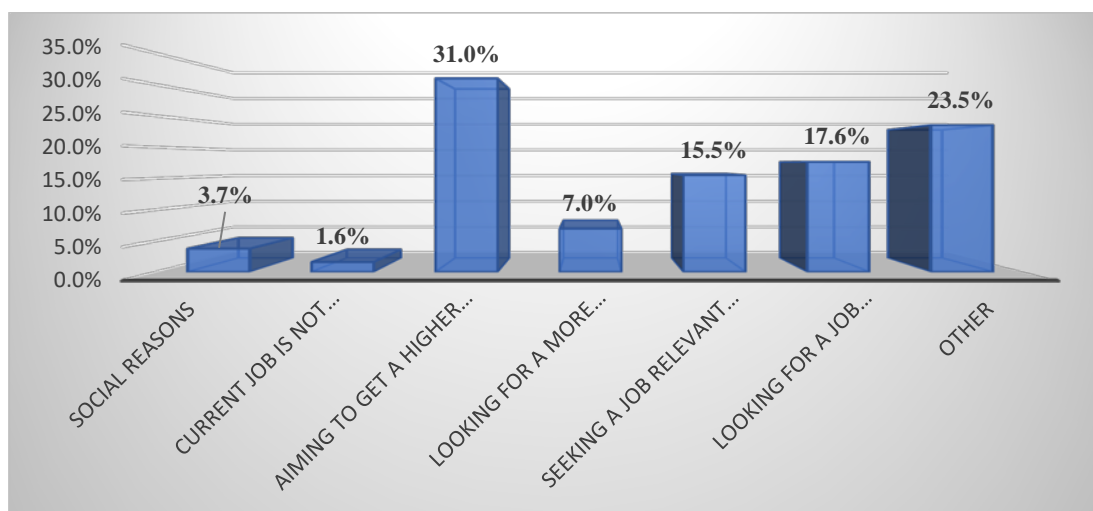


Figure 4-11 Frequency distribution of the reason for job seeking

4.6.3.9 Participated in training courses to do this job

In this question, participants were asked if they had participated in training courses to qualify for this job. More than three quarters (75.9%) of the participants responded with “yes”, leaving the minority of 24.1%, who said “no” and thus did not participate in training courses to get their current jobs (Table 4-26).

Table 4-26 Frequency distribution for participating in training courses to do this job

Participated in training courses to do this job	Number	Percentage
Yes	142	75.9%
No	45	24.1%

4.6.3.10 The funding for this course

The respondents talked about the expenses for courses they had participated in and this information is presented in Table 4-27 and Figure 4-12. Their responses show that 84 (54.9%) of the total participants who took these courses took them at the expense of the organisation. This was followed by 32.7% (50 participants) who said they took the course at their own expense. The remaining respondents paid for courses through “joint expenses”.

Table 4-27 Frequency distribution for the expense of this course

Getting a job	Number	Percentage
Self-funded	50	32.7%
Joint funded	19	12.4%
Organisation-funded	84	54.9%

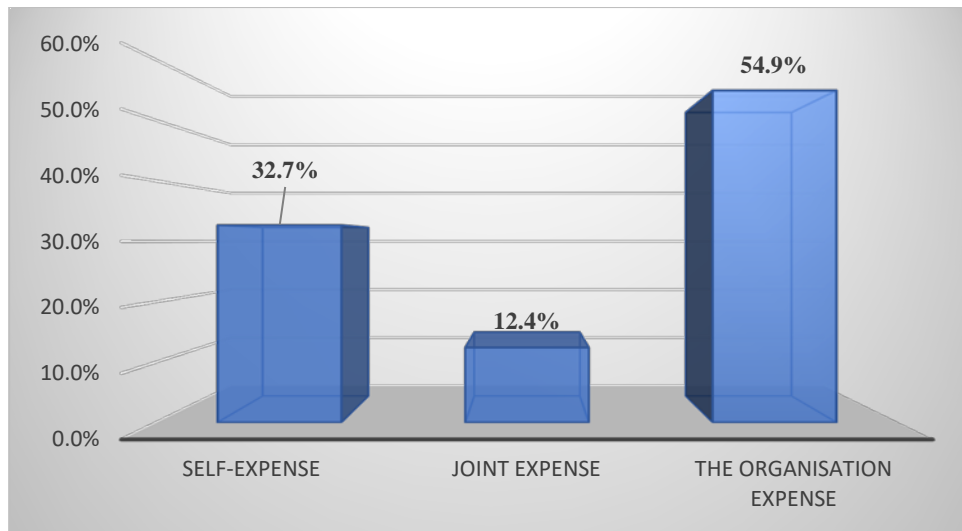


Figure 4-12 Frequency distribution for the expense of this course

4.6.3.11 Location of the training course and the topic of the training course

Those who had taken training courses were asked whether they took the courses in Libya or abroad and their responses were collected and presented in Table 4-28. It is clear that most participants had taken their courses in Libya, as only 11.2% of the participants had taken their courses abroad.

Table 4-28 Frequency distribution for the location of training course

Location of the training course and the topic of the training course	Number	Percentage
Libya	151	88.8%
Abroad	19	11.2%

4.7. Discussion

When the data were divided according to gender, the results showed that both genders incurred income loss if education was mismatched in their current job. However, males incurred a substantial loss because of current skills mismatch. Therefore, the consequences indicate that the pay effects of skills mismatch are much lower than those of educational mismatch and, in the case of Libya's female graduates, skills mismatch employees earn a wage

comparable to their matched counterparts. Thus, an analysis relying on an examination of the impact of mismatch on earnings alone might lead to the conclusion that education mismatch characterises a more substantial productivity constraint relative to skills mismatch, with the severity of the impacts more pronounced among females.

4.8 Job satisfaction

This section investigates the determinants of job satisfaction in the Libyan economy. Firstly, it analyses the data from the questionnaire, then applies the bivariate analysis using the correlation matrix. Finally, it estimates the determinants of job satisfaction using multivariate analysis (regression).

4.8.1 Cronbach's Alpha result

Cronbach's Alpha is one of the commonly employed tests to evaluate the validity and reliability of data (Bland & Altman, 1997). The theoretical value of alpha varies from 0 to 1 since it is the ratio of two variances and the variance in the denominator is always at least as large as the variance in the numerator. However, based on the estimation procedure used, estimates of alpha can take on any value less than or equal to 1, including negative values, although only positive values make sense. Higher values of alpha are more desirable. Some professionals, as a rule of thumb, need reliability of 0.70 or higher with 0.60 as the lowest acceptable threshold (obtained on from a substantial sample) before they will use an instrument. An alpha value of 0.7 to 0.8 is regarded as satisfactory (Bland & Altman, 1997). In this study, the alpha value is 0.702 which reflects an acceptable level of reliability for the data in the current study.

Table 4-29 Reliability Statistics

Cronbach's Alpha	N of Items
0.702	3

Table 4-30 Case Processing Summary

		N	%
Cases	Valid	186	99.5
	Excluded ^a	1	0.5
	Total	187	100.0

a. Listwise deletion based on all variables in the procedure.

4.8.2 How satisfied are you with the following aspects of your job?

This section deals with participant satisfaction with three different terms, which are: *self-satisfaction*, *level of challenge* and *value of work experience*, and the collected results are listed in Table 4-31. The data shows that in general, “dissatisfied” had the largest portion of 18.7% of the participants who responded with it, ranging between 27.8% and 18.7% in statements of: “*level of challenge and self-satisfaction*” respectively.

Table 4-31 the percentages (%) of the responses mean and standard deviation to the statements of satisfaction with the following aspect of the job

Getting involved in the job	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Mean	SD
Self-satisfaction	12.8	18.7	25.1	24.1	19.3	3.2	1.30
Level of Challenge	15.5	27.8	24.1	18.7	13.9	2.9	1.28
Value Work Experience	17.1	24.1	29.9	19.3	9.6	2.8	1.21

This was followed by “satisfied” which had an average of slightly less than 21%, and ranged from 18.7% (“*level of challenge*”) to slightly higher than 24% (“*self-satisfaction*”) for the respondents who responded to the survey, where, the “neutral” had the largest percentages (26.4%).

In addition, the relevance of the results from Table 4.31 to the statements for the question on “satisfaction in the job” can be explained based on the average level of respondent satisfaction with them as follows:

Statement 1: “*Self-satisfaction*”. The mean agreement with this statement is relatively high at 3.2, with the highest standard deviation of 1.30. The percentage of respondents who rated this statement as “satisfied” and “very satisfied” is 43.4% of the respondents to the survey. According to the Likert Scale Interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 2: “*Level of Challenge*”. The mean agreement with this statement is relatively smaller than the previous statement, at 2.9 with a standard deviation of 1.28. The percentage of respondents who rated this statement were completely different; as “very dissatisfied” and “dissatisfied” had the largest percentage of 43.3% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 3: “*Value Work Experience*”. The mean agreement with this statement is the smallest 2.8 with the lowest standard deviation of 1.21. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is high. with slightly more than 40% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

4.8.3 Self-assessment of skills at graduation

This statement deals with ten different terms which are listed in Table 4.32. In general, the data shows that, both choices “very satisfied” and “satisfied” have large percentages in all cases, with respect of only four statements related to the English language (speak in English and write in English) and adaptability and problem solving, and they range from about 20% (Speak in English) to 47.6 % (Self-discipline and communication), with an average of 35.5% of respondents who responded to the survey.

On the other hand, both terms “very dissatisfied” and “dissatisfied” have the lowest percentages in six of ten statements with a slightly higher average of 36.4% of respondents who responded to the survey and it ranges between slightly higher than 13% at “self-discipline” and 27.3% at “write in English” of respondents who responded to the survey.

Table 4-32 the percentages (%) of the responses mean and standard deviation to the statements of Self-assessment of skills at graduation

Self-assessment of skills at graduation	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Mean	SD
Adaptability	12.3	27.3	29.4	21.9	9.1	2.9	1.15
Problem solving	11.8	24.1	34.2	21.9	8.0	2.9	1.12
Self-confidence	6.4	21.4	28.9	21.4	21.9	3.3	1.22
Self-discipline	4.3	21.9	26.2	28.3	19.3	3.4	1.10
Teamwork	8.6	24.6	27.3	22.5	17.1	3.2	1.22
Communication	8.6	22.5	21.4	25.1	22.5	3.3	1.28
Speak in English	31.0	18.2	31.0	11.8	8.0	2.5	1.27
Write in English	33.7	20.9	24.6	10.7	10.2	2.4	1.33
Information technology	17.6	17.6	26.2	29.9	8.6	2.9	1.24
Numeracy skills	7.0	24.6	31.6	26.2	10.7	3.1	1.12

In addition, the option “neutral” had the largest proportion at slightly higher than 28% of respondents who responded to the statements, where it ranged between 21.4 “communication” and 34.2 “problem solving”. In addition, the relevance of the results from Table 4-32 to the statements of this dimension “self-assessment of skills at graduation” can be explained based on the average level of the respondents' agreement as follows:

Statement 1: “*Self-assessment of skills at graduation of Adaptability*”. The mean agreement with this statement is 2.9 with a standard deviation of 1.15). The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is slightly less than 40% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 2: “*Self-assessment of skills at graduation of Problem-solving*”. The mean agreement with this statement is relatively low at 2.9, with standard deviation being relatively lower at 1.12 than the previous statement. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is slightly less than 36% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 3: “*Self-assessment of skills at graduation of Self-confidence*”. The mean agreement with this statement is 3.3 and the standard deviation is relatively high compared to the previous statements; 1.22. The percentage of respondents who rated this statement differ from the previous values, where the terms “very satisfied” and “satisfied” have the highest percentage with slightly lower than 44% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 4: “*Self-assessment of skills at graduation of Self-discipline*”. The mean agreement with this statement is the highest (3.4) with standard deviation being the lowest at 1.10. The percentages of respondents who rated this statement are similar to the previous statement where the terms of “very satisfied” and “satisfied” have the highest percentages with a total of slightly less than 48% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 5: “*Self-assessment of skills at graduation of Teamwork*”. The mean agreement with this statement is 3.2 and the standard deviation is relatively high with 1.22. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 40% of respondents to the survey. According to the Likert Scale Interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 6: “*Self-assessment of skills at graduation of Communication*”. The mean agreement with this statement is relatively low at 3.3 with standard deviation being relatively high with 1.28. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 48% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 7: “*Self-assessment of skills at graduation of speak in English*”. The mean agreement with this statement is 2.5 with standard deviation being relatively high at 1.27. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is relatively high with higher than 49% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 8: “*Self-assessment of skills at graduation of write in English*”. The mean agreement with this statement is relatively low at 2.4 with standard deviation being relatively high with 1.21. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is the highest, and it was slightly less than 55% of respondents to the survey. According to the Likert Scale Interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 9: “*Self-assessment of skills at graduation for Information technology*”. The mean agreement with this statement is relatively low at 2.9, with standard deviation being relatively high with 1.21. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 39%, followed by “very dissatisfied” and “dissatisfied” with 35.2% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 10: “*Self-assessment of skills at graduation of Numeracy skills*”. The mean agreement with this statement is 3.1, with standard deviation being relatively high at 1.24. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is relatively low with slightly less than 37% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

4.8.4 Self-assessment of skills now

This question deals with ten different terms which are listed in Table 4-33. In general, the data shows relatively similar results with the previous statement “*Self-assessment of skills at graduation*” with a slightly higher average of 46.7% of respondents who responded to the survey where both choices “very satisfied” and “satisfied” have large percentages in all cases, with respect of only two statements related to the English language (speak and write in English) and they ranged from slightly less than 33.7% and 35.3% for write and speak in English, relatively, to slightly less than 57% in Self-confidence and communication respectively.

On the other hand, the terms “very dissatisfied” and “dissatisfied” have the lowest percentages for eight of ten statements with an average of 18.2% and it ranged between slightly higher than 13% for “self-discipline” and 27.3% for “write in English”. In addition, the term “neutral” had

the largest proportion, at slightly higher than 28% of respondents who responded to the survey in some statements where it ranged between 18.7% for “self-confidence” and 29.9% for “Information technology”.

Table 4-33 the percentages (%) of the responses, mean and standard deviation to the statements for self-assessment of skills now

Self-assessment of skills now	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Mean	SD
Adaptability	11.8	16.0	23.5	31.6	17.1	3.3	1.257
Problem solving	10.2	16.6	28.3	32.1	12.8	3.2	1.174
Self-confidence	9.6	15.0	18.7	26.2	30.5	3.5	1.320
Self-discipline	12.8	15.0	19.3	24.6	28.3	3.4	1.374
Teamwork	9.1	20.3	19.8	25.1	25.7	3.4	1.310
Communication	8.6	13.9	20.9	29.4	27.3	3.5	1.266
Speak in English	24.6	11.8	28.3	20.3	15.0	2.9	1.381
Write in English	24.1	18.2	24.1	15.0	18.7	2.9	1.430
Information technology	11.8	13.9	29.9	23.5	20.9	3.3	1.261
Numeracy skills	10.2	21.4	25.7	24.1	18.7	3.2	1.260

In addition, the relevance of the results from Table 4-33 to the statements for this dimension “self-assessment of skills now” can be explained based on the average level of the respondents' agreement as follows:

Statement 1: “*Self-assessment of skills at graduation of Adaptability*”. The mean agreement with this statement is 3.3 with a standard deviation of 1.26. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 50% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 2: “*Self-assessment of skills at graduation of Problem-solving*”. The mean agreement with this statement is relatively low at 3.2 with a standard deviation which is relatively lower at 1.17 than the previous statement. The percentage of respondents who rated

this statement as “very satisfied” and “satisfied” is slightly less than 45% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 3: “*Self-assessment of skills at graduation of Self-confidence*”. The mean agreement with this statement is 3.5 and the standard deviation is 1.27, which is relatively high when compared to the previous statements. The percentage of respondents who rated this statement differ from the previous values where the terms of “very satisfied” and “satisfied” have the highest total percentage of slightly lower than 57% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 4: “*Self-assessment of skills at graduation of Self-discipline*”. The mean agreement with this statement is the highest at 3.5 from among the rest of the statements, while the standard deviation is the lowest, with a value of 1.32. The percentage of respondents who rated this statement is similar to the previous statement, where the terms of “very satisfied” and “satisfied” have the highest percentage with slightly less than 53% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 5: “*Self-assessment of skills at graduation of teamwork*”. The mean agreement with this statement is 3.4. The standard deviation is relatively high with a value of 1.37. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 51% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 6: “*Self-assessment of skills at graduation Communication*”. The mean agreement with this statement is relatively high at 3.5 and the standard deviation is relatively low at 1.27. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 57% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 7: “*Self-assessment of skills at graduation to speak in English*”. The mean agreement with this statement is 2.9 and the standard deviation is relatively high at 1.38. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is

relatively high with more than 37% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 8: “*Self-assessment of skills at graduation to write in English*”. The mean agreement with this statement is 2.9 and the standard deviation is relatively high 1.43. The percentage of respondents who rated this statement as “very dissatisfied” and “dissatisfied” is the highest at this statement at slightly less than 43% of respondents to the survey. According to the Likert Scale Interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 9: “*Self-assessment of skills at graduation of Information technology*”. The mean agreement with this statement is relatively high 3.3 with the standard deviation being relatively high with a value of 1.26. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is slightly less than 45% followed by those who rated this statement as “very dissatisfied” and “dissatisfied which were 25.7% of respondents to the survey. According to the Likert Scale Interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

Statement 10: “*Self-assessment of skills at graduation of Numeracy skills*”. The mean agreement with this statement is 3.2 and the standard deviation is 1.26. The percentage of respondents who rated this statement as “very satisfied” and “satisfied” is relatively low with slightly less than 43% of respondents to the survey. According to the Likert Scale interpretation, the mean value ranges between 2.6 and less than 3.4, making the level of satisfaction for this statement moderate.

4.8.5 Statistical association for both self-assessment of skills at graduation and self-assessment of skills now

A T-test has been used in this section to analyze the association between self-assessment of skills at graduation and self-assessment of skills now to determine whether there is statistical significance or not. The results in Table 4-34 below are for the paired samples t-test between self-assessment of skills at graduation and self-assessment of skills now.

Table 4-34 Significance association of the self-assessment of skills at graduation and self-assessment of skills now

Parameters	self-assessment of skills at graduation and self-assessment of skills now
Adaptability	0.003
Problem-solving	0.010
Self-confidence	0.096
Self-discipline	0.744
Teamwork	0.079
Communication	0.048
Speak in English	0.002
Write in English	0.002
Information technology	0.010
Numeracy skills	0.382

The data shows that there are statistical significance differences in the association between the two variables of “self-assessment of skills at graduation” and “self-assessment of skills now” for five of ten statements; “adaptability, problem solving, communication and speak in English, speak in English and information technology” with p-values less than 0.05 for these statements. Moreover, evidence is found that there are statistically significant differences between “self-assessment of skills at graduation” and “self-assessment of skills now”.

4.9 Measurement of the level of higher education

This section focuses on the measurement of higher education levels and it includes four questions that are relevant to the usefulness of the study programme in the current jobs of participants, satisfaction with the relevance of their study programmes, the level of the workplace and the most appropriate level of education for the work they are doing.

4.9.1 To what extent is your programme of study helpful in doing your current job?

In this question, the respondents were asked about how helpful their study programme is in their current job. It is clear to see that the participants were mostly (47%) satisfied with the statement. In contrast, only a quarter of respondents were dissatisfied with this statement, where approximately the remaining quarter of participants responded with “neutral”, to the statement (see Table 4-35).

4.9.2 How satisfied are you with the relevance of your study programme for your present job?

In this question, the respondents were asked about their satisfaction with the relevance of their study programme to the present job. The data in Table 4-35 shows that the participants were divided into three parts that were almost equal: 31.0% neutral, 33.7%; satisfied and 35.3% dissatisfied with the statement.

4.9.3 The level of workplace

In this question, the respondents were asked about the level of the workplace in their current job. It is clear to see that the participants were mostly (42.8%) satisfied with the statement. On the contrary, about 20% of the sample size of the respondents, were dissatisfied with this statement where approximately 36% of the total participants were “neutral” with the statement see table 4-35.

4.9.4 What is the most appropriate field of employment for the work you are doing?

This question focuses on the most appropriate field of employment for the work they are doing, the respondents had four options; only their own field, a field related to theirs, a field completely different from theirs and no specific fields being required for this job. It is clear to see that, the participants mostly (70.6%) selected both only their own field (67N; 35.8%) and a field related to theirs (65N; 34.8%). This was followed by 15.5% of the total participants who responded to this survey who have selected “*no specific fields are required for this job*” with the remaining 13.9% of the total participants responded by selecting “completely different from your field” as the most appropriate field of employment for the work they are doing.

Table 4-35 the percentages (%) of the responses mean and standard deviation to the statements of the programme of study helpful in the current job

The measurement of the level of Higher Education	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Mean	SD
To what extent was your programme of study helpful in doing your current job?	11.2	16.0	25.7	28.3	18.7	3.3	1.258
How satisfied are you with the relevance of your study programme for your present job?	17.1	18.2	31.0	24.1	9.6	2.9	1.225
The level of workplace	7.5	13.9	35.8	34.2	8.6	3.2	1.041
What is the most appropriate level of education for the work you are doing?	5.9	6.4	25.7	29.4	32.6	3.8	1.151

4.9.5 What is the most appropriate level of education for the work you are doing?

In this question, the respondents were asked about the most appropriate level of education for the work they are doing. It is clear to see that the participants were mostly (62.0%) satisfied with the statement. In contrast, a small percentage (12.3%) of respondents were dissatisfied with this statement, where approximately 25% of the total participants responded with “neutral” to the statement (see Table 4-36).

Table 4-36 the mean percentages (%) of the responses and standard deviations of the statements of “the most appropriate field of employment for the work the participants are doing”

The most appropriate field of employment for the work you are doing	Number	Percentage
Only your own field	67	35.8
Related to your field	65	34.8
Completely different from your field	26	13.9
No specific fields are required for this job	29	15.5

4.10 The measurement of level of skill

In this section, the participants who responded to this questionnaire were asked to what extent they agreed with the statement, “your current job offers you sufficient scope to use your knowledge and skills” and whether they would perform better in their current job if they possessed additional knowledge.

4.10.1 Your current job offers you sufficient scope to use your knowledge and skills

The data in Table 4-37 shows that approximately half of the total participants are satisfied with the above statement, while 27.8% of the total participants responded with “satisfied” and 18.2% responded with “very satisfied”. This is followed by the option of “neutral”. at 63N (33.3%). The remaining, smallest group of 38 participants (20.3%) said they were very dissatisfied and dissatisfied with this statement.

Table 4-37 the percentages (%) of the responses mean and standard deviation to the statements of the measurement of the level of skill

The measurement of the level of skill	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Mean	SD
Current job offers you sufficient scope to use your knowledge and skills	9.6	10.7	33.3	27.8	18.2	3.3	1.18
The best performance in the current job	10.2	9.6	20.9	8.2	41.2	3.7	1.36

4.10.2 You would perform better in your current job if you possessed additional knowledge

The responds to the statement of “*You would perform better in your current job if you possessed additional knowledge*”, showed that the participants were mostly very satisfied with that statement, where slightly more than 41% of the total participants said they were “very satisfied”, in addition to about 8% who said they were satisfied with the statement. Less than 20% of the total participants who responded to the questionnaire were dissatisfied; this is made up of 10.2% who were very dissatisfied and 9.6% who were dissatisfied. The remaining (approximately 21%) of the total participants who responded to the questionnaire said they were neutral regarding the statement.

4.10.3 Score out of 10 the following factors in respect of how much they support or inhibit your personal development

This question relates to eight factors that would help in developing a person's skills and these factors are listed in Table 4-38. The participants who responded to the question have responded with a score using the scale of 1 being totally inhibited and 10 being totally supported. The data shows that both extremes of totally inhibited and totally supported, have the lowest and highest percentages which ranged from 3.2% to 12.8% and from 10.7% to 30.5%, respectively.

Table 4-38 the percentages (%) of the responses mean and standard deviation to the statements of “the following factors in respect of how much they support or inhibit your personal development”

Statements	Score out of 10									
	1	2	3	4	5	6	7	8	9	10
Type of business of employer	11.2%	8.0%	12.8%	5.3%	9.6%	10.7%	9.1%	11.8%	10.7%	10.7%
Level of responsibility	7.0%	4.3%	9.6%	6.4%	9.1%	9.6%	14.4%	8.6%	12.3%	18.7%
Level of intelligent Challenge	8.0%	9.1%	8.0%	0.5%	10.7%	9.6%	12.3%	19.3%	10.2%	12.3%
Personal attitude is easy and self-confident	4.8%	8.0%	10.2%	2.7%	4.8%	9.1%	4.8%	20.3%	11.2%	24.1%
Foreign language ability	12.8%	9.1%	8.0%	7.5%	8.6%	11.8%	8.0%	9.6%	7.5%	17.1%
Level of numeracy	4.3%	13.4%	8.0%	8.0%	8.0%	8.0%	8.0%	13.4%	13.9%	15.0%
Level of literacy	3.7%	7.0%	10.7%	3.7%	8.6%	5.9%	5.3%	13.4%	11.2%	30.5%
Technical skills and language	3.2%	8.0%	7.5%	5.3%	7.0%	6.4%	11.2%	18.2%	12.8%	20.3%

In addition, the highest scores (from 6 to 10) recorded values which exceeded 10% for most statements; these scores generally had the highest percentages at eight out of ten statements, ranging from 52.9% (Type of business of employer) to 69.5% (personal attunes easy self-confident). The score from 1 to 5 had the lowest percentages of the total respondents, which ranged between 30.5% (Personal attitude is easy and self-confident) and 47.1% (Type of business of the employer; Table 4-38).

4.11 Bivariate analysis: Correlation Matrix

Table 4-39 presents the results of conducting a Pearson correlation analysis which examines the relationship between every two variables in the study.

Table 4-39 Pearson Correlation Matrix

	Satisfaction	Education	Skills
Satisfaction	1		
Education	.305***	1	
Skills	.640***	.335**	1

The Pearson metric shows that employees' satisfaction is positively and significantly associated with both education and skills mismatch at a 0.01 level of significance. Also, Pearson values did not exceed 0.8 for any of the three variables in all cases. This means that multi-collinearity problem will not cause a severe statistical problem if a regression analysis has been conducted.

4.12 Multivariate analysis: Regression Analysis

Table 4-40 shows a summary of the estimated model. From this table, the adjusted R² suggests that 0.411 of the variability in satisfaction could be explained by both education and skills factors, which is statistically acceptable and representative. Also, the Durbin-Watson value of 1.928 is very close to the critical value of 2 (Saunders et al., 2009). This implies that auto-collinearity will not be a statistical problem when a regression analysis is carried out.

Multiple linear regression was calculated to predict the satisfaction of graduates based on their skills and education level. A significant regression equation was found ($F(2, 183) = 65.488, p < .000$), with an R^2 of .417. Graduates' predicted satisfaction is equal to $.873 + .123$ (Education) and $+ .545$ (Skills). These results in Table 4-40 show that graduates' satisfaction increased 0.123 units for each year of education. The results also show that when the skills rise by 1 year, the graduate's job satisfaction increases by 0.545 units. Skills were a significant predictor of job satisfaction, but education was insignificant.

The table of residual statistics below summarises the predicted values and residuals in unstandardized and standardised forms. It is important to report these statistics to avoid the issue of outliers. For instance, outliers can be identified as those observations with standardised residual values above 3.3 (or less than -3.3). From our results below, it appears that they do not have any outliers.

Table 4-40 linear regression estimations: determinants of job satisfaction

Model Summary				
Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
1	.646 ^a	.417	.411	.72208

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.290	2	34.145	65.488	.000 ^b
	Residual	95.415	183	.521		
	Total	163.705	185			

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.873	.254		3.441	.001		
	Education	.123	.081	.091	1.517	.131	.877	1.140
	Skills	.545	.054	.608	10.091	.000	.877	1.140

Residual Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.5660	4.1414	3.0984	.60757	186
Residual	-2.24407	1.67578	.00000	.71816	186
Std. Predicted Value	-2.522	1.717	.000	1.000	186
Std. Residual	-3.108	2.321	.000	.995	186

a. Predictors: (Constant), Skills mismatch, Education mismatch

b. Dependent Variable: Job Satisfaction

Table 4-40 shows the coefficients of this model. The collinearity statistics in this table are 0.877 for Tolerance and 1.140 for VIF. In this regard, Saunders et al. (2009) argue that tolerance values that are closer to 1 and VIF values of less than 10 are statistically acceptable. This means that collinearity issues should not be statistically problematic and will not affect the results of the regression analysis in the current study.

Table 4.40 suggests that the skills mismatch variable is positively and significantly related to employee satisfaction at a 1% level of significance, where the P-value is 0.000 and the T-test value is 3.441. This implies that over-skilled employees in the construction sector in Libya are highly likely to be satisfied with their jobs. In other words, over-skilled employees in this sector in Libya do not believe that they should be re-evaluated and offered advantages and benefits over what they have already based on their current contracts. However, there is no relationship between overeducation and satisfaction. The P-value for the relationship between over-education and employee satisfaction is 0.131, which is greater than 0.1, and the T-test value is 1.517. This means that over-educated employees do not necessarily feel satisfied with their positions in the Libyan construction industry.

These results will be discussed in the next section.

4.13 Discussion

It is clear that education and skills mismatch, although correlated, can be considered as distinguished phenomena, given that those of one do not completely integrate the wage effects of the other. To discuss this issue further, there is consideration of both the educational and skills mismatch variable on a measure of job satisfaction contained within the data. The rationale here is that reductions in job satisfaction will more minutely reflect the extent to which any special form of mismatch is understood as an issue for the individual. The existence of wage penalties does not in itself make an issue for policy intervention, given the possibility that individuals may choose to trade off lower wages for other sides of the job, such as increased flexibility, job autonomy, situation, etc. Previous studies have established that educationally mismatched employees have lower levels of job satisfaction (Battu et al., 1999; Fleming & Kler, 2008). However, for Britain, Green and Zhu (2010) find that over-education is not a problem for job satisfaction in itself if it is not accompanied by skills mismatch. Similarly, in Spain, Badillo-Amador and Vila (2006) also indicate that skills mismatches are a better predictor of job satisfaction than educational mismatches.

Concerning job satisfaction, the results indicated that overall job satisfaction was lower if graduates were unable to utilise all their field-specific knowledge and engage in analytical

thinking. However, employees with surplus computer-related skills were found to have higher levels of job satisfaction, suggesting that some value is placed on the ability to keep pace with technical progress in a job context. When the overall high-level skill and high-level education controls are reintroduced into the model, the general job satisfaction penalty of 23 per cent remains unchanged, suggesting that individual high-level skill variables are not effectively identifying the causes of lower job satisfaction. However, the situation alters somewhat when the sample is again split according to gender. The positive return to surplus computer skills shows to be particular to males.

Furthermore, the results of this study are consistent with human capital theory. In particular, the human capital approach suggests that an individual's actual level of educational attainment offers an incomplete measure of the human capital that he or she brings to a particular job. This is because, in addition to educational attainment, the human capital endowment can be acquired from work experience and on-the-job training. This implies that over-education is associated with excess schooling but a lack of training and work experience. However, the reverse holds for undereducated employees who have accumulated better forms of human capital endowment (work experience and training) to compensate for their lack of education. Consistently, the findings of this study indicate that when it comes to employee satisfaction, mismatch could be an issue in the cases of skills mismatch rather than education mismatch.

4.14 Summary

This chapter has highlighted the significant differences between groups using the independent variables of gender, age, marital status, education, experience, job characteristics and firm size, for both educational mismatch graduates and skills mismatch graduates. There are significant differences in job characteristics and satisfaction. Also, there are significant differences between educational mismatch graduates and skills mismatch graduates, which leads into the following chapter, where the research objectives and educational and skills mismatch characteristics in universities graduates are discussed.

Over 60% of the response to this questionnaire came from participants who have a university certificate from the University of Misurata. More than two thirds of the participants responding currently have a job, whereas 122 of the total 254 respondents did not get a paid job between the period of their graduation and their current job and about half of the total of respondents work for a facility owned by the community. In addition, about one-third of the total have less than three years' work, where 120 of 187 have a medium-level job, and half of the participants said they had got their jobs through family and friends via networking.

The level of satisfaction with the statement around "Self-assessment of skills at graduation" with the ten cases of adaptability, problem-solving, self-confidence, self-discipline, teamwork, communication, numeracy skills, writing in English, information technology and speaking in English was moderate. The levels of satisfaction in the statement "self-assessment of skills now" with the similar ten cases were also moderate. The data shows that there are statistically significant differences between the two variables of "self-assessment of skills at graduation" and "self-assessment of skills now" for five of the ten statements. Furthermore, this chapter tested the factors that determine job satisfaction in the Libyan economy, and it found that skills are a significant variable for job satisfaction.

Chapter 5 Conclusions and recommendations

5.1 Introduction

The primary purpose of this study is to investigate the educational mismatch between university graduates and the Libyan construction labour market to determine the effects of this mismatch. Also, it examines the factors driving job satisfaction in recent graduates in the Libyan labour market. The study also seeks to critically analyse the level of education and skills of graduates from universities who have recently joined the labour market or are currently working in the construction sector. The purpose of this chapter is to summarise the results of the study as well as to provide implications for researchers and, policymakers that may help in the development of Libya's construction labour market specifically and the Libyan labour market in general. Finally, the chapter discusses a plan for future research.

5.2 . Summary of findings

One of the key objectives of this study is to explore the incidence of educational and skills mismatch in the Libyan labour market. In this study, the primary data was collected through questionnaire for construction graduates in Libyan universities. The general results in Chapter 4 indicate that a majority of employees, irrespective of data, held jobs commensurate with their level of education; however, a sizeable number of employees, 30%, were educationally mismatched for their jobs. Furthermore, the incidence depends upon the educational mismatch measurement. Using educational mismatch (helpful) and educational mismatch (satisfaction) definition, graduates reported the highest incidence of educational mismatch (30% on average). As a comparison, the incidence of educational mismatch in Libya is in a range with other studies from developing countries, as discussed in Chapter 2.

With respect to skills mismatch, a majority of employees in the construction sector were employed in jobs that matched their skills. Nevertheless, 30% of the sample was classified as being a skilled mismatch: as moderately skilled mismatch at 27% and severe skills mismatch at 18%. The incidence of skilled mismatch seems higher than reported in Libya compared with previous empirical studies such as Mavromaras, Mcguinness, O'Leary, Sloane, and Fok (2010), Nadia (2014), Trabelsi & Hamida (2014), Bedir (2014), and Yunus & Hamid (2016).

Furthermore, the findings from Chapter 4 showed that on-the-job search activity was positively and strongly associated with an educational mismatch. The risk of being engaged in

on-the-job searching was higher amongst the educational mismatch employees, and the magnitude of the effects was greater for the severely educationally mismatched than for the moderately mismatched. This fits with the notion that educational mismatch may be temporary, since the educationally mismatched seek alternative employment. However, one has to be careful since the data only allows one to ascertain and match quality across jobs. Nevertheless, the story so far is one of the severe educational mismatches facing the greatest earnings loss, greater job dissatisfaction, and a higher propensity to search for alternative employment.

5.3 Limitations of the study

This thesis has utilised preliminary data from the questionnaire that has been collected from the graduates of universities in Libya who have recently worked or are currently working in the construction sector, to analyse a whole host of issues surrounding mismatch in the Libyan labour market. Developing a new and dedicated data set for the issue of mismatch would, of course, be too costly and unrealistic. However, several improvements are suggested. First, all data is cross-sectional, with limited work histories, so that gauging changes over time is tricky if not impossible. A full-blown panel data set with questions on mismatch and labour market outcomes whilst desirable may not be feasible. The best answer one can appeal for is that current surveys are repeated so that the researcher has at his or her disposal repeated cross-sections. Second, larger scale datasets within Libya, such as the labour force survey and surveys of graduates, should include specific questions on mismatch. The questions on educational mismatch should focus on the educational levels required to obtain and perform a job, as noted by Dolton and Silles (2008), “What is/was the minimum formal qualification level required for entering/to get this job” and “What do you believe to be the education level required to actually do this job?”. With respect to educational mismatch, the skills mismatch questions could follow the questions in HILDA (for Australia) or the WERS (for the UK), respectively: “I use many of my skills and abilities in my current job” and “How well do the skills you personally have match the skills you need to do your present job?”. Indeed, the measurement of skills mismatch may be more informative than the measurement of the Educational mismatch because it is less tainted by unobserved individual heterogeneity European Centre for the Development of Vocational Training (2010). To capture the temporary or otherwise nature of mismatch, these questions should be addressed to current and previous jobs.

Several challenges were encountered during this study. The time and manpower available to conduct this research was a constraint.

5.4 Policy Recommendations

It is recommended that the Libyan government and policymakers should put forward the goals of its political strategy with regard to education, and start to develop a national plan and strategy for Libyan Higher Education. It should also arrange open and participatory consultation with all relevant stakeholders in Libyan higher education. The Ministry of higher education need to look thoroughly at internal restructuring and capacity needs and should tackle problems that impact the educational process at the university level. Specifically, it should look at eliminating the difficulties that face the quality of education outcomes. The Ministry of higher education should introduce policies concerning skills that are required in the labour market by improving the curricula in the light of recent scientific and technological developments. Also, they should have some connection with employers (private sector) to gain an idea what specific skills are required. On the other side, the Bureau of statistics and census Libya (office of statistics) should be involved in the survey about education mismatch and the labour market.

International bodies such as the World Bank, International Monetary Fund (IMF) and International Labour Organization (ILO) should provide grants and scholarships to do research on educational mismatching and the labour market in Libya.

5.5 Future research and Recommendations from the study

This research has by necessity been exploratory in nature, due to the poorly understood nature of the link between high education output and labour market requirements in Libya and the low level of previous research and understanding of this situation. This thesis has therefore addressed some key questions. Significant positive change in the high education output and the labour market requirements in Libya are highlighted in the findings of this research. However, to maximize the benefits and minimize the risks, more research of this type is needed. Such studies should cover a larger variety of graduates from universities and the Libyan labour market, and should certainly be conducted in different regions of Libya before any comprehensive conclusions may be reached. In light of these results, the limitations of the study and the difficulties encountered in the course of the research, the following recommendations are proposed for further research on the educational mismatch and the labour market requirements in Libya:

- Blending quantitative and qualitative methods in educational research provides greater confidence in the validity and reliability of data deriving from its associated methods and

the validity of the findings drawn from this data. So, quantitative and qualitative methods are needed to study the relationship between the higher education output and the labour market requirements in the future.

- Conducting a larger scale study for examining differences in education and skills level between males and females, as there may be a difference in the education and skills level between them. A future study should consider different questions to determine whether the skill levels are different between the two groups, in order to optimize the exploitation of their education and skills.
- Further research is needed to identify reasons for the disconnect between skills learned at university and applications in the workplace.
- Further research is needed to determine the impact of the socioeconomic status of graduates and employers on career choice, career commitment, maintained discipline, and their professional and work ethic.
- Further research is needed to determine the impact of educational and skills mismatches on the wages and job satisfaction of graduate employees.

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Appendix



School of the Built Environment

Questionnaire to university graduates who recently or are currently working in the construction sector in Libya

Dear Graduate

I am in the process of undertaking an M.Phil. in Construction and Property Economics at Salford University. This programme will conclude with the submission of a thesis on my chosen research area.

My M.Phil. thesis topic is: **Educational and skills mismatch of University Graduates with Labour Market Requirements in the Construction Sector in Libya**

In order to carry out this project, I will inevitably need the help of university graduates who have recently worked or are currently working in the construction sector in Libya. So, I would like to invite you to participate in the study. The research project will require participants to respond to a questionnaire on their experience and attitudes.

I appreciate that your participation in the study will require a certain amount of time. I anticipate that the time would be between 10-15 minutes.

I also want to make it clear that your details will not be discussed or disclosed to anyone other than myself. Your name and organisation will not be published in the final document. If you wish to withdraw from the study at any time, then that

is acceptable. If you agree to take part and at any time you have any concerns about the study then please do not hesitate to speak with me or my supervisor..... at the University of Salford (.....@salford.ac.uk).

I hope that this letter gives you sufficient information to be able to consider if you would be prepared to take part in this research project. If you have any further questions, then my contact details are set out below.

In addition, if you know of other university graduates who have recently worked or are currently working in the construction sector in Libya who may be prepared to participate, please let me know. If there are any queries that you have prior to agreeing to participate then please do not hesitate to contact me using the contact details below.

Best Regards

Alhasan Osman

School of the Built Environment

University of Salford

Manchester- United Kingdom

Mob UK: +447456612525

Mob LY: +218913537030

Email: A.Osman1@edu.salford.ac.

* Required

A. **Personal information**

1. Nationality * Mark only one
 Libyan
 Non-Libyan

2. Gender * Mark only one
 Male
 Female

3. Age * Mark only one
 20-25
 26-30
 More than 30

4. Marital status * Mark only one
 Single
 Married

5. Region * Mark only one
 Tripoli Region
 Middle Region
 Western Region
 Benghazi Region
 Eastern Region
 Southern Region

6. * If the place of residence differs from the place of work, please specify the working area.....
.....

B. Study Information

7. Qualification *

Mark only one

- Graduate Diploma
- Bachelor
- Masters
- PhD
- Other.....

8. University awarding your Certificate *

Mark only one

- Tripoli University
- Benghazi University
- Misurata University
- Sirt University
- Sebha University
- Omar Al-Mukhtar University
- Alzaitona University
- Alzawia University
- Aljabl Agarbi University
- Almergeb University
- Other.....

9. Faculty awarding your Certificate *

Mark only one

- Faculty of Engineering
- Faculty of Economics and Political Science
- Faculty of IT
- Faculty of Law
- Other.....

10. Department *

Mark only one

- Civil Engineering
- Architecture
- Electrical Engineering

- Accounting
- Economy
- Business Management
- General Administration
- Marketing
- Computer science
- Online Systems
- Networking and Communication
- Law
- Other.....

11. Academic year of graduation *

Mark only one

- 2010/2011
- 2011/2012
- 2012/2013
- 2013/2014
- 2014/2015
- Other.....

12. General grade at graduation *

Mark only one

- 50-65
- 66-75
- 76-85
- 86-100

13. Did you have paid-work during your final year of study *

Mark only one

- Yes
- No

14. Have you got a job in the current period? *

Mark only one

- Yes Skip to question 13
- No Stop filling out this form

15. Did you get a job with pay after the graduation and before the current job?

- Yes
- No

C. Work Information

16. Classification by Employer type*

Mark only one

- Facility owned by the community
- Libyan company
- Foreign company
- Private Company
- Self-employed with others
- Self-employed
- With household (family business)
- Other.....

17. Firm size *

Mark only one

- < 25 employees
- 26–99 employees
- 100–499 employees
- > 500 employees

18. Job status *

Mark only one

- staffing
- Contract Permanent
- Contract - Temporary
- Other.....

19. How long have you been working in this job? *

Mark only one

- Less than one year
- Between 1 and 3 Years
- Between 3 and 5 Years
- More than 5 Years

20. Job title *

Mark only one

- Upper level job
- Medium level job
- Low level job

21. Monthly Salary *

Mark only one

- | | |
|---|--|
| <input type="checkbox"/> Less than 600 DL | <input type="checkbox"/> 1001-1200 DL |
| <input type="checkbox"/> 601-800 DL | <input type="checkbox"/> 1201-2000 DL |
| <input type="checkbox"/> 801-1000 DL | <input type="checkbox"/> More than 2000 DL |

22. How did you get this work? *

Mark only one

- Advertisement
- Manpower department
- Networking/family/friends
- Training Centres
- Sponsorship
- Already worked here before further study
- Other.....

23. Are you currently looking for a job? *

Mark only one

- Yes Skip to question 24.
- No Skip to question 25.

24. What is the main reason for job seeking? *

Mark only one

- Looking for a job compatible with qualifications
- Aiming to get a higher salary
- Current job is not suitable
- Seeking a job relevant to my field of study
- Looking for a more challenging job
- Looking for a permanent position
- Social reasons
- Other reasons.....

25. Have you participated in training courses to do this job?

- Yes Skip to question 26
- No Skip to question 27

26. The expense of this course?

- Self-expense
- The organisation expense
- Joint expense

27. Location of training course

- Libya
- Abroad

28. What was the topic of the training course [please specify]

D. Job satisfaction

29. How satisfied are you with the following aspect of your job? **Mark only one per row**

1 = Extremely Low and 5= Extremely High

	1	2	3	4	5
Self-satisfaction					
Level of Challenge					
Value Work Experience					

30. Self-assessment of skills at graduation *

Mark only one per row

1 = not very good and 5= excellent

	1	2	3	4	5
Adaptability					
Problem solving					
Self-confidence					
Self-discipline					
Teamwork					
Communication					
Speak in English					
Write in English					
Information technology					
Numeracy skills					

31. Self-assessment of skills now *

Mark only one per row



1 = not very good and 5= excellent

	1	2	3	4	5
Adaptability					
Problem solving					
Self-confidence					
Self-discipline					
Teamwork					
Communication					
Speak in English					
Write in English					
Information technology					
Numeracy skills					

E. The measurement of level of higher Education



32. To what extent was your programme of study helpful in doing your current job? *

Mark only one

	1	2	3	4	5	
Extremely Unhelpful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely Helpful



33. How satisfied are you with the relevance of your study programme to your present job? *

Mark only one

	1	2	3	4	5	
Extremely Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely High

34. The level of workplace *

Mark only one

	1	2	3	4	5	
Extremely Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely High

35. What is the most appropriate level of education for the work you are doing? *

Mark only one

	1	2	3	4	5	
No qualification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Degree

36. What is the most appropriate field of employment for the work you are doing? *

Mark only one

- Only your own field
- Related to your field
- Completely different from your field
- No specific fields are required for this job

F. The measurement of level of skill

To what extent do you agree with the following statements?

37. Your current job offers you sufficient scope to use your knowledge and skills. *

Mark only one

