

# **A critical assessment of the Technical Education and Training programme in Libya for the national oil industry**

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## Dedication

**This thesis is dedicated to:**

*my late Mother*

*and*

*my Father*

## Declaration

The thesis is submitted to Edinburgh Napier University for the degree of Doctor Philosophy.

In accordance with Edinburgh Napier University regulations governing the Degree of Doctor of Philosophy, the candidate declares that this thesis was written entirely by her and that all work reported herein was carried out by her except where acknowledged and referenced.

Ibtihal Yuseif

..... Date .....

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## **Abstract**

The development of competent technicians for the oil and gas industries is vital for a sustainable economy in Libya. One of the major factors that brought about modernisation in the country is the export of oil and gas. This has allowed Libya to embark on profound growth and expansion in all sectors, including health and education. Technical education is one of the most significant components of Human Resources Development (HRD). Therefore, the government has embarked on establishing the Technical Education and Training (TET) programme for preparing and developing technicians to work in the oil and gas industries. This thesis focuses on an assessment of the TET programme. It is important to note that to the knowledge of the researcher, there has been no research conducted to assess TET programme in Libya. Therefore, this study can be considered as an initial source of information that is aimed to contribute to the knowledge in this field.

In order to understand the nature of the TET programme and how it is perceived by the respondents, two research approaches were adopted, namely quantitative and qualitative. The results suggest that the respondents are positive about issues relating to the process of the TET programme and the relationship between the Petroleum Training and Qualifying Institute (PTQI) and the oil and gas industries in conducting this programme. To establish this, 3 questionnaires were used to collect data from the teaching staff, students and technicians who attended the TET programme. Results of the quantitative analysis suggest that respondents mostly agreed on issues related to the quality of the TET programme, the curricula, teaching and learning, educational resources and educational planning and assessment. However, although these results show a positive perception towards the TET programme, up to 38.5% of the respondents were negative on issues related to the quality of the TET programme, curricula, teaching and learning, educational resources and educational planning and assessment. In addition, results indicated that the managers at the PTQI and oil industries were working in partnership to organise and manage the TET programme. These results appear to suggest that although the majority of the respondents were happy with the TET programme further studies may be required to understand the effectiveness of the TET programme.

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## Abbreviations

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GDP	Growth Domestic Product
HRD	Human Resources Development
LNEO	Libyan National Enterprise for Oil
PTQI	Petroleum Training and Qualifying Institute
SPSS	Statistical Programme for Social Sciences
TET	Technical Education and Training

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# **Chapter One**

## **Research Conceptual Framework**

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### **1.1- Introduction**

The objective of this thesis is to assess the technical education and training (TET) programme for the preparation of skilled technicians in the oil industry in Libya. This is an essential issue as the programme plays a vital role in the education and development of technicians. It is also important to note that since the establishment of the Petroleum Training and Qualifying Institute in 1970, there have not been any studies in relation to this subject. Hence, this research may contribute significantly to knowledge in this area and prompt further studies in the future.

In order for the oil industry to survive and perform effectively, it needs to respond to the growing global demand for crude oil, which means that it needs to consider intrinsic and extrinsic factors. This requires continuous staff development through the acquisition of new knowledge, skills, attitudes and perspectives (Buckley and Caple, 2004). Therefore, technical education and training can help not only to supply a skilled and knowledgeable workforce for the workplace, but can also contribute by supporting and updating the knowledge and skills of the existing employees (Jessup, 1991; Middleton et al., 1993; Lynton and Pareek, 2000). If this is done, it will enable employees to cope with the growing developments in these technologies and the preparation of skilled technicians will provide an appropriate means for managing and developing a section of the human resources for the oil sector both independently and self-sufficiently. Indeed, since the late 1990s, the Libyan government has placed a great deal of emphasis on the technical education and training programme, particularly to support the oil industry. Thus, a significant part of the training needs has been met nationally by the universities and specialised institutions, such as the Petroleum Training and

Qualifying Institute (PTQI). This was different in the 1960s and 1970s, when the vast majority of trainees (approximately, 90%) gained their training abroad (PTQI, 2005). The importance of the development of national technical and training programme was echoed by the PTQI information booklet (PTQI, 2006) which stated:

*The decision to establish the institute came at a time when there was a total lack of trained Libyan technicians who could run and maintain field equipment instead of multinational companies' personnel. Taking advantage of this lack of trained nationals, the multinational companies not only monopolised the production of oil, but also controlled and exploited the Libyan economy (PTQI, 2006, p. 3).*

Therefore, the national technical and training programme is closely associated with the development of human resources. Indeed, technical education and training is an essential part of Libya's HRD and is closely linked to economical success, job creation, and the overall prosperity of the country (Misko, 2006; Ahmed, 1995). Skilled human resources in Libya are still relatively small compared to other countries, and particularly in Europe and this is why progress in the Libya oil sector has been dependent upon technical expatriates (Yesuf, 1984; Hageg, 1986; UNISCO, 1996). The literature therefore indicates that the Arab Oil producing countries, of which Libya is one, should use their human resources effectively, expanding their capacity and dealing effectively with the problems of technical vocational education and training (Watson, 1982; Shaw, 1983). Thus, the focus in this thesis is to assess the TET programme in Libya and, in order to achieve this, both quantitative and qualitative approaches have been used to collect data from the following five sample populations:

- 1- The teaching staff at PTQI, using a questionnaire.
- 2- Students at PTQI, using a questionnaire.
- 3- Technicians in the oil industries who formerly studied at PTQI, using a questionnaire.
- 4- Heads of departments and top management at PTQI, using an interview and



5- Top management officials of the oil industries using an interview.

## 1.2- Theoretical framework

Theoretically, the concept of human resources development through technical education and training is a crucial process for the development of the oil sector in Libya. This is due to the direct association between Libya's economy and production. In fact, the economy, HRD and technical education are closely associated with each other in terms of performance. In addition, there is close correlation between economic development and the development of higher education (Hanushek and Kim, 1995; Kingdon, 1996; El-Khawas et al., 1998). For example, enrolment ratios in higher education include over 50% of the Organization for Economic Cooperation and Development countries, as compared to 21% in middle income countries and 6% in low income countries (World Bank, 1998, cited in El-Khawas et al., 1998).

The impact of each variable performance can also influence other variables. Thus, the relationship between these variables can be viewed as a triangulation, as illustrated in Figure 1.1. Training and education are essential elements for organisational transformation, as both emphasise employment and organisational performance (Lynton and Pareek, 2000).

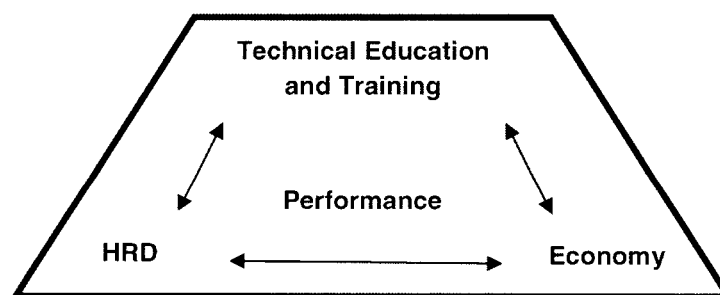


Figure 1.1. Triangulation of HRD, technical education and the economy.

Source: the researcher.

Hence, staff training is also an essential aspect of organisational change, particularly in view of the dynamic economy and technological changes that these demand to equip the workforce with the necessary skills. Training and

education therefore constitute a step forward towards a healthy oil industry capable of supporting the Libyan economy.

The Libyan government has pledged a continuing process to ensure that the oil industry has adequate skilled technicians capable of maintaining and strengthening competent staff in all fields of the industry. This continuous development has contributed to an increase in the performance of the management of the oil sector as a whole. In fact, the PTQI has played a significant role by supplying technicians to the oil industries since 1970 as well as reinforcing their skills through training programmes (PTQI, 2006). PTQI is therefore considered an important component in the development of human resources in the oil industry. However, to the researcher's knowledge no study has been conducted on the assessment of the TET programme offered by the PTQI since its establishment in 1970.

The assumptions underlying the relationship between technical education and the improved performance of technicians require a process of formal education with the aim of narrowing the theory and practice gap; this should lead to a well-managed form of transformation in the workplace. Lynton and Pareek (2000) discuss the way training is set up and consider training in term of business and industry. Thus, training and human resources development can be viewed in relation to knowledge and competence, particularly in technical positions in industry such as engineering. Here, knowledge-gathering constitutes training where new competencies can be acquired by the trainees or existing competencies enhanced. The authors maintain that competency relates to effectiveness in a task and the enhancement of the performance of the participant within the organisation (Lynton and Pareek, 2000, p.32).

The framework for this research is associated with assessment of the TETP so that technicians can be supplied to the oil industry. McDonald et al. (2006) maintain that the assessment of technical education is a vital process, as the assessment can address the learning performance and competence of the technical education. Generally, the assessment of a technical educational

programme is complex, involving teaching and learning, the curricula, resources, strategy and policies being adopted as well as the relationship of the educational institute with industry (Harasim, 1995; Vleuten, 1996; Joy-Mathews et al., 2004; Buckley and Caple, 2004). Figure 1.2 exemplifies the conceptual model of the relationship showing the attributes that govern the development of TETP as run by the PTQI. The term attribute refers to various activities and practices that shape the performance of the PTQI. The model identifies the significance of intervening contributors in the development of TETP, in which both intrinsic and extrinsic attributes can influence the performance of the PTQI. The intrinsic relations of attributes, for example, are associated with the strategies and policies of the PTQI, these concerning the teaching and learning process. In this model, the levels of skill, knowledge, and competence of students after they graduate and work in oil industries as technicians is associated with the performance of the educational process. In addition, the model also identifies extrinsic attributes, where the Ministry of Oil provides the political support to the TETP through the National Oil Corporation, as the Libyan's economy is heavily dependent on oil production and export.

To resolve the complexity of the interrelated attributes in Figure 1.2, this study seeks to assess the key contextual areas inherent in the nature of PTQI for delivering the technical education and training programme.

The key areas of analysis in this thesis are:

- 1- The quality of the technical education and training programme, analysing the role of the PTQI to supply competent technicians to the oil industry;
- 2- Curricula-analysis to establish the contribution of the curricula in enabling students to be competent in their future employment in the oil industry;
- 3- Teaching and learning - to analyse the educational process in developing the student's skills and knowledge capacities, as well as to enable the students to narrow the theory and practice gap;

- 7- Students' knowledge and skills – investigating the students' competence in different aspects related to decision-making, problem solving and predicting problems.

The assessment of the TET programme is vital for professional technicians and for the workplace in the oil industries (Clagett, 1997). The literature indicate that the TET programmes must prepare a well-defined, knowledgeable workforce with a high performance level and emphasised on the standards of the educational quality and to develop employees for technical level jobs (Benn and Stewart (1998; Dyrenfurth, 2000; Harkins, 2002; Rojewski, 2002; Keiser et al., 2004)

### **1.3- Study Consideration, Aim, Objectives, and Purpose**

The aim of this study is to assess the potential of Libya TET programme in delivering competent and effective technicians to the oil industry. In addition, the objective is also to explore the nature and level of partnership between the PTQI and the oil industries as regards the management of this programme.

Generally, technical and vocational education and training (TVET) has received a great deal of attention by governments across the globe to provide a skilled national workforces for different industries (Maclean, 2002; Hughes, 2005). Although Libya is no exception, it concentrates more on the oil industry. Indeed, as indicated above, the oil industry is a vital sector, as the Libyan economy is essentially dependent on it. Therefore, technical and vocational education is justified for the preparation of technicians where the graduates are most likely to get their employment at the end of their preparation through TET programme.

To develop labour, different countries have established suitable institutional arrangements for the delivery of education and training work, either in a formal or non-formal setting (Bhola, 1995). As the Libyan PTQI has been a part of the formal education and training system to deliver technical education and a training programme, it is primarily designed to support oil industries in Libya with skilled and knowledgeable technicians. Consequently, this study is designed to examine

the perceptions of the main categories of respondents (stakeholders), with the aim of achieving the following objectives:

- 1- To provide a general perspective on the role of PTQI in developing a skilled workforce for the oil industry;
- 2- To explore respondents' (teaching staff, students and technicians in the oil industry) perceptions on how they perceive the quality of education in developing an effective workforce for the oil industry;
- 3- To examine the effectiveness of curricula in supporting the acquisition of knowledge and skills needed for the oil industry;
- 4- To assess the quality of the teaching and the learning process, and to establish how much this contributes to the students' progress.
- 5- To assess the quality of the educational resources and to establish how efficient they are in supporting the educational and training perspectives;
- 6- To identify the strengths and weaknesses of the planning and assessment policy in the PTQI.

The researcher argues that any ideas resulting from this should be analysed within the skills, effectiveness, and performance of the technical education and the training programme. In analysing the respondents' perceptions, the study also argues that the role of the PTQI must be taken in the consideration.

In addition, the purpose of this research is:

- 1- To provide new information that can be used to establish a base for further research in the future;
- 2- To address the nature of the partnership between the PTQI and the oil industry;
- 3- To understand how the main stakeholders (teaching staff, students, technicians, the PTQI and the oil industries management staff) perceive the provision of the training education and training programme in relation to the main educational, training and collaboration issues;

- 4- To establish how the main drives facilitate an improvement in graduate potential and bring about an easy transformation for graduates to work in the oil industry.

#### **1.4- Hypotheses and Research Questions**

As indicated above, technical education and training constitute the common practice of human resources development. The literature indicates that various organisations train their employees to reinforce their vocational and technical knowledge and skills (Klarsfeld and Mabey 2004). Although every country has different perspectives towards the provision of training, the latter is considered to be beneficial for developing human resources (Klarsfeld and Mabey, 2004). Clearly, the purpose of the Libyan technical educational and training programme is to supply and develop the national workforce for the oil industries. Therefore, in order to seek answers to the research questions regarding the assessment of PTQI in Libya, this research hypothesises that:

- 1- Respondents (the managers in both institutes and oil industries) consider that they are not collaborating fully in setting up the strategies and policies of the institute with respect to the curricula development, educational visits to the oil industry, the number of enrolled students and the employment of graduates. This hypothesis can be justified through collecting and analysing qualitative data and using a structured interview.

#### **Statement 1**

The scope of modern management has changed, mainly due to the fast growing technologies in the oil industry. Hence, training and education play a significant role in the development of the modern oil industry. One vital area that management regulates is the setting up of institutional strategies and techniques to help individuals, groups and organisations fully realise their potential objectives. The strategies also help individuals to undertake tasks to enhance the effectiveness of the organisation (Smith, 2003; Joy-Matthews et al., 2004).

Human resources are finite and need to be managed and valued in the context of organisational strategies and policies. The strategy, direction and goal of an organisation may generate learning needs that can be facilitated by linking them with human resources development (HRD). Linking HRD to strategy prioritises learning that will contribute directly to the organisation achieving the strategy (Joy-Matthews et al., 2004).

2- Respondents of the TET programme provider (the teaching staff) and the TET programme users (oil industry) hold that they are not adopting a partnership strategies and policies with the aim to increase the effectiveness and efficiency of the TET programme. This hypothesis can be justified through collecting and analysing qualitative data and by using the following structured interview.

### **Statement 2**

Successful partnerships between educational institutions and industries are essential for modernisation and are beneficial for students, enabling them to acquire skills and knowledge which will inevitably contribute to an improvement in the national economy (Pagtakhan and Rock, 2002; Gauder et al., 2004). The purpose for the academic institution, in working in partnership with industry, is that it provides the opportunity for students to gain easy access to training placements (Senaratne et al., 2003; Callan and Ashworth, 2004). Moreover, the industry can benefit from providing the opportunity for training, particularly during academics visit to the industry (Al-Jumaily and Stonyer, 2000). Hence, there is a mutual benefit for both the academic institutions and the industry from the relationship, and this may lead to the development of partnerships.

3- Respondents (Teaching staff, students, and technicians) do not think that the PTQI offers quality education and training in conducting the TET programme.

### **Statement 3**

Quality is an issue of concern in technical education, particularly as it demonstrates the suitability of the academic institution (Juran, 1988; Frazer, 1992; Knight, 1999; Natarajan, 2000). Garvin (1987) identified eight dimensions for the term quality, namely, performance, features, reliability, conformity, durability, serviceability, aesthetics and perceived quality. Hence, the performance of the PTQI can be attributed to the purpose of the teaching and learning process and its efficiency in achieving its objectives. The features of the PTQI are related to its partnership with oil industry and the PTQI's contribution in raising technical standards of work in the oil sector. In addition, reliability, conformity, durability and serviceability dimensions have a bearing on the quality of the measures of the PTQI in adopting a consistency of performance in the technical education and training programme. Coupled with these quality dimensions, perceived quality is an additional dimension, which is also associated with the term 'quality' alternative and is often referred to as reputation (Garvin, 1987).

Quality assurance is another term in administration; this signifies individual responsibility in the organisation as regards understanding and maintaining or enhancing the quality of the product or service, where the management regularly checks the validity of the system by checking the quality (Frazer, 1992). Franklin (1992) and others (Stephenson, 1992; Ibrahim, 1999) indicate that the narrower definition of quality as 'fitness for purpose' largely derives from the manufacturing sector. 'Fitness for purpose' requires that the product or service should fulfil the customer's needs, requirements or desires (Rowley, 1996). Institutions should have a clear mission, explicit quality assurance systems and be committed to improving quality. They must also have effective policies for improving access and for staff development and their study programmes need to have clear aims and objectives to which the subject content relates; teaching methods are also required to reflect the varied needs of learners. Additionally, the assessment



methods should be valid, fair and the criteria should be understood by both the staff and the students (Harvey et al., 1992).

- 4- Respondents (the teaching staff, students, and technicians) think that the PTQI does not provide and delivers curricula that enable the students to acquire knowledge and skills required by the oil industry needs for their development.

#### **Statement 4**

The purpose of the curriculum in technical education is to prepare a competent and skilled workforce, with knowledge and skills which are both adaptable and have a high performance level (Harkins, 2002; Keiser et al., 2004). Therefore, both curriculum design and delivery are most likely to determine the performance and competence of the graduates. In this respect, human resources development (HRD) is closely associated with technical education and training. HRD is concerned with the provision of learning and development opportunities that support the achievement of organisational strategy and improvement as well as team and individual performance (Raiden and Dainy, 2006). The curriculum should also be specific to the workplace, with the aim of enabling the students to apply their academic knowledge in their future careers (Bragg and Reger IV, 2000; Stefani, 2005; Minton, 2007).

- 5- Respondents (the teaching staff, students, and technicians) think teaching and learning process are not carried out effectively to support graduates after they take up their job in the oil industry.

#### **Statement 5**

Teaching is one of the indicators of a faculty's quality. Moreover, it is the core of the education system as far as the teaching-learning process is concerned (Natarajan, 2000). Although teaching-learning is a broad area, technical education usually integrates technology, which is often associated with the workplace and the market (Bragg and Reger IV, 2000). Teaching and learning clearly involve diverse methods and styles and effective teaching in technical

education requires cognitive abilities, practice as well as integrated academic and applied instruction (Felder and Silverman, 1988). Different elements are also associated with teaching and learning perspectives and include particular issues relating to teaching to increase the student's competence and skills during the course of the study.

- 6- Respondents (the teaching staff, students, and technicians) think that the institute is not well equipped with the resources that support the development of the key competencies necessary for the work in the oil industry in Libya.

### **Statement 6**

Educational institutions, as with any other organisation, are essentially concerned with human, physical, and financial resources (Bryson, 1996; Roknuzzaman, 2007). Further, the attributes of the teaching staff, equipment and laboratories are the major consideration in knowledge-based technical education and training programmes. Therefore, although there are a variety of essential resources, the teaching staff, library, and equipment are the major concerns in technical education and training; the oil industry requires a workforce with knowledge-based engineering that has both theoretical and practical aspects to support the acquisition of skills and knowledge in the relevant fields of education. In this way, students can be transformed into competent technicians equipped with knowledge and skills.

- 7- Respondents (the teaching staff, students, and technicians) think that the institute does not adapt educational planning and assessment to improve teaching and learning standards.

### **Statement 7**

Planning and the assessment of educational tasks are common activities of school administration and are part of the objectives of the educational process. Tasks cannot be implemented effectively without prior planning and making decisions about what to do, how to do it and when. Educational tasks and

training programmes also require particular measures to assess the quality and effectiveness of the educational process and to establish the extent to which the graduates can participate in the improvement and development of the oil industry. Hence, the concern here relates to teaching and learning, the teaching techniques and development in order to support the educational institution and maintain a high quality programme.

In order to test these hypotheses, the research presented in this thesis will develop an existing perspective to introduce a contrast that is able to shed light on the nature of the PTQI in providing qualified workforce for the national oil industry and to answer the following research questions:

- 1- What does PTQI do and what settings are embraced? (Chapter 2).
- 2- What is the conceptual distinction between training and education? (Chapter 3).
- 3- What are human resources and in which settings can education and training contribute to development? (Chapter 3).
- 4- What is the demographic setting of the stakeholders? (Chapter 4)
- 5- How do the stakeholders perceive the different issues of the TETP? (Chapters 4 and 5)
- 6- To what extent can the PTQI and the oil industry collaborate to develop competent technicians? (Chapter 6).
- 8- How can the top management at both the PTQI and in the oil industry know that strategies are being addressed which will enable them to embark on the TETP?
- 9- What conclusions can be drawn from this study? (Chapter 7)

The literature has emphasised the importance of the research questions, which can be used to define the fundamental nature of the investigation for the study (Blaxter et al., 2006; Moore 2006). The research questions above aim to establish information about the nature of the TETP and the effectiveness of the

PQTI in delivering the programme. They are also designed to obtain information relating to how the respondents perceive issues concerning the critical assessment of this programme. Therefore, the research questions may contribute to an understanding of how the respondents shed light on different issues relating to the assessment of technical issues and the training programme. Thus, it can contribute to the knowledge in the field of technical education and training and human resources development. Because of this, the research presented here will develop specific information on the TETP using a mixture of quantitative and qualitative approaches.

### **1.5- Study Framework and clarification of concepts**

This study framework and its structural development require a definition of the research problem and its set of aim, and objectives. It also involves the hypotheses and research questions. Hence, alongside these elements, the initial theoretical framework in section 1.2 can be elaborated on through a synthesis of various issues. These include the literature survey of the topic as regards technical education, training, and human resources development (HRD). In this respect, the literature review is essential secondary information to understand other researchers' works and to set out the research agenda and strategy by exploring the background of the research topic (Blaxter et al., 2006). This also contributes to the formulation of the aim, rationale, objectives, hypotheses, research questions, and methodological instrument (Dencombe 2003; Blaxter et al., 2006; Moore, 2006).

In addition to the secondary information, two research methods are used to generate the primary information most likely to shed light on the nature of the technical education and training programme and the associated issues relating to the PTQI performance as well as its partnership with the oil industry. A general overview of the research methodology for generating the necessary data includes both quantitative and qualitative approaches. These will be described in more detail in Chapter 4 (Research methodology). Notwithstanding this, the

steps for this research process are illustrated in Figure 1.3. The sequence of events in conducting research involve gathering the information to define the research problem before conducting the methodology. Many literature recommend to use both quantitative and qualitative approaches to overcome the weaknesses of each (see Chapter 4). This methodology is followed by the field study, data collection and analysis, presentation of the data which were round them up in the last chapter to draw the conclusion.

For clarification, it is essential to identify certain terms associated with this research. These include:

**The Technical Education and Training Programme (TETP)** - this is the formal technical education, specifically designed to support the oil industry in Libya. The programme is delivered by the Petroleum Training and Qualifying Institute (PTQI). The duration of the study is 3 years.

**Technical Education** – This refers to the preparation of individual for a career directly associated with the development of expertise with particular techniques. Stress is laid on comprehension and the practical application of the basic principles of science and technology, with the aim of preparing the graduates for occupations with skilled ability but below the level of the scientific or engineering professions. (Britannica, 2008). Technical education in the PTQI prepares the students to undertake careers in the national oil industry. It is therefore purposely designed to supply skilled and knowledgeable technicians to the oil industry.

**Education** – This refers to the formal or informal process and series of learning activities designed to assimilate and develop knowledge, skills, values and understanding (Buckley and Caple, 2004; Britannica, 2008). Heimlich (1993) reviewed the concept of education and used a similar definition for education, namely an organised, sustained activity for the purpose of acquiring knowledge, skills or values. Formal learning often takes place in a school or a school-like environment (Britannica, 2008). Informal education, however, also refers any organised, intentional and explicit effort to promote learning to enhance the quality of life through a non-school setting (Heimlich, 1993). The term in this

of HRD in this thesis intentionally refers to the planned and structured technical learning as conducted by the PTQI to prepare and improve the skills and knowledge of technicians for the Libyan oil industry.

**Training** – refers to discipline that is concerned with methods of teaching and learning in schools or school-like environments with the aim of achieving effective performance in an activity or range of activities of a given task or job. (Buckley and Caple, 2004; Britannica, 2008). In addition, training is the act, process, or method that trains or provides practical education in any profession (Davidson et al., 1994; Merriam-Webster Dictionary, 2003). Generally, training is associated with the skill, knowledge, or experience acquired by an individual, or the state of being trained (Merriam-Webster Dictionary, 2003).

**Partnership** – refers here to the relationship between the PTQI and the oil industry, and involves collaboration to deliver the TETP. Batorski and Hughes (2002) indicate that partnerships often involve the sharing of resources to add value to a product or service for suppliers and customers. The main area that shapes the development of a partnership is the environmental one that governs the relationship between the educational institution and the oil industry.

## **1.6- Thesis Structure**

The research presented in this thesis is as follows:

Chapter One stands as an introductory chapter to this thesis and introduces the principal conceptions relating to the thesis topic as well as the intentions in pursuing this study. The purpose of this chapter is to set out the theoretical perspectives of the thesis, specifying the aim, objectives and the rationale for this research. Hence, these aspects alongside the research questions and hypotheses form the framework for the research.

Chapter Two provides the Libyan context in general with special reference to the Petroleum Training and Qualifying Institute (PTQI). This chapter, therefore, gives the general background information on Libya, oil and Libyan economy and an overview of the PTQI.

Chapter Three provides the conceptual information and literature review in relation to education, training and human resources development. It embraces a discussion on the interrelationship between these terms as well as the human resources development in developed and developing countries.

Chapter Four describes the development of the methodology that was used to implement the research techniques. It gives general background to the quantitative and the qualitative approaches adopted in this research to collect data. Alongside the description of the methodology, this chapter gives the details of the techniques, including the research design, sample population, collecting the data and conducting the reliability test for collected data.

Chapter Five Results and Discussion- This chapter provides the results for the analysis obtained from the questionnaires and the interviews. The general analysis and discussion aimed to answer the main research questions. Data were analysed statistically by frequencies, percentage, mean, and chi square. This chapter is presented in mainly 3 parts; the demographic characteristics of the respondents, the quantitative and the qualitative data analysis.

Chapter Six General discussion and conclusion. This chapter focuses on the general summary, an overview of data analysis and hypotheses justification, and conclusion and recommendations.

### **1.7- Summary and Conclusion**

Chapter One focused on the conceptual framework of the research, including the objectives, research questions and hypotheses. It discussed and explained the main issues associated with this research in technical education and the training programme in Libya, and therefore constituted an introductory chapter for this thesis. In order to investigate the research problem, both quantitative and qualitative approaches were adopted and elaborated through the questionnaire and the interview respectively. The data in Chapters Five and Six shed light on the reality of how the respondents perceive different issues about technical education and the training programme in Libya.

Generally, assessment of the technical education and training programme is considered a vital issue in Libya for supporting the oil sector and the national workforce. The researcher considered it timely to conduct this study since no study has been conducted on this topic or areas related to it. In fact, the training programme for the oil industry was established 1970, and many graduates have found work in the oil industry. Consequently, a critical assessment would initiate research in this area; any resulting information may be considered as new information to be explored and utilised in further research, with the aim of identifying the strengths and the weakness of the technical education and training programme. Research in this area will also explore particular aspects of the performance of the PTQI and its contribution to the development of human resources in the oil industry. The next chapter will focus on the Libyan context in relation to the Petroleum Training and Qualifying Institute (PTQI).



## **Chapter Two**

### **Libya Contexts**

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#### **2.1- Introduction**

This chapter focuses on the Libyan context, giving background information about the country with special reference to the oil sector and the development of technicians for the oil industries. The national education system in Libya has emphasised how the specialities of knowledge start from secondary school. This stage and that of higher education have contributed to the sustainable economic growth essential of the country. Indeed, the technical education and training (TET) programme in Libya provides the skilled workforce for the national oil industry. With growing focus on technical education in Libya, the issue of skilled technicians has become an urgent matter for the oil industries. This has resulted in an emphasis on the importance of education, as it offers particular benefits in relation to human resources development, including the following (ELDIS, 2006):

- It creates a pool of qualified people with the knowledge and skills to contribute significantly to economic development.
- It allows individuals to expand their choice and to improve personal and work-related skills.
- The increased availability of secondary education significantly influences the demand for and completion of primary education.

The purpose of this chapter is to triangulate three issues: education, the economy and human resources development; these three areas greatly concern the graduates of the Petroleum Training and Qualifying Institute (PTQI) who work as technicians in the oil industry in Libya. The structure of this chapter includes the following main points.

Libya ranks as the fourth largest African country after Sudan, Congo and Algeria, but has the lowest in population among these three countries (Table 2.1). The vast majority (approximately 90%) of Libyan land is desert and as of 2007 it had a population of 6,036,914 which is mostly concentrated in the major cities such as Tripoli (1,149,000), Benghazi (636,000), Misurata (360,000), and Al Mirqab 328,000), Al Bitnan (142,000) and Sebha (126,000) (CIA, 2007; The Economist 2008).

Statistics for 2007 indicate that Libyan society has slightly more males than females in the 'under-15 years' and '16 - 64 years' age ranges but this does not apply to the age group of 65 years and over (Intute.ac.uk, 2008). Most Libyans (62.4%) belong to the '6 - 64 years' age group, 33.4% are 0-15 years, while 4.2% are 65 years and over (Intute.ac.uk, 2008).

Table 2.1. Libya by area and population compared to the largest African countries in the area<sup>1</sup>.

	Area (km <sup>2</sup> )	Population	Population growth rate (%)
Libya	1,759,540	6,036,914	2.262
Sudan	2,505,810	39,379,358	2.082
Algeria	2,381,740	33,333,216	1.216
Congo	342,000	65,751,512	3.39
World	510,072,000	6,602,224,175	1.167

<sup>1</sup> The data represent statistics for 2007 and was generated online through [www.intute.ac.uk/sciences/worldguide/countrycompare.html](http://www.intute.ac.uk/sciences/worldguide/countrycompare.html).

Table 2.2 compares the Libyan economical structure with the three largest African countries. The statistics for 2007 show that Libya has the third lowest labour force and GDP after Algeria and Sudan, but is ranked third as regards growth domestic product (GDP); it showed the highest GDP per capital in 2007. In addition, the Libyan GDP real growth rate (%) fluctuated from 2003: it decreased from 7.1% in 2003 to 5.4% in 2004 and stayed the same in 2007.

Compared to the other three African countries in Table 2.2, the Libyan GDP real growth percentage rate ranked second after Sudan (Table 2.2).

Table 2.2. Libya according to its economical structure compared to the largest African Countries in area<sup>1</sup>.

	Libya	Sudan	Congo	Algeria	World
Labour force (million)	1.82	7.415	-	9.38	3.001 billion
GDP (US \$billions)	78.79	107.8	19.07	268.9	65.82 trillion
GDP per capita (US \$)	13,100	2,500	3,700	8,100	10,000
GDP real growth rate (%)	5.4	12.8	2.8	4.6	5.2

<sup>1</sup> The data represents statistics for 2007, which was generated online through [www.intute.ac.uk/sciences/worldguide/countrycompare.html](http://www.intute.ac.uk/sciences/worldguide/countrycompare.html).

### 2.3- Oil and the Libyan Economy

Although the Libyan economy declined during the embargo between 1986 and 2003, the economy showed a slow and gradual improvement at the beginning of the millennium, particularly after the lifting of the embargo in 2003. The main initiative since 1990s by the Libyan government (to strengthen the economy) was based on changing its course from a command to a market economy (The Economist, 2008). In a command economy, the government controls all the decisions relating to the production of oil and marketing, while in a market economy, private companies operate production and marketing. In this context, Libya's policy has allowed various overseas private companies to invest in the oil and gas sector: 26 or 81.25% are multinational companies from a variety of countries, while the rest (4 or 18.75%; Table 2.3) are Libyan companies (EIA, 2007).

The Libyan economy is predominantly dependent on oil revenues, which form approximately 95% of the total export. The low population and high oil revenues place Libya at the top of the list of GDP per capita among African Countries (CIA, 2007). In addition, Libya holds the largest proven oil reserves in Africa, followed by Nigeria and Algeria and it ranks fourth in holding natural gas reserves in Africa

(Figure 2.2). In January 2007, the total oil reserve in Libya was 41.5 billion barrels of crude oil and 52.6 trillion cubic feet of gas (www.eia.doe.gov).

Table 2.3. Oil and gas companies operating in Libya.

		Total(%)
<b>Libyan Companies</b>	Es Sider, Marsa el-Brega, Tobruk, Ras Lanuf, Zawiya, Zuetina	<b>6 (18.75)</b>
<b>Multinational Companies</b>	Amerada Hess, Canadian Occidental, ChevronTexaco, CNPC, Eni, Husky Oil, Indian Oil Corp., Liwa (UAE), Medco Energy (Indonesia), Naftogaz Ukrainy, Nimr Petroleum (Saudi Arabia), Norsk Hydro, Occidental, OMV, ONGC, Pedco (South Korea), Petrobras (Brazil), PetroCanada, Petronas (Malaysia), Red Sea Oil Corp. (Canada), Repsol, Shell, Total, Verenex (Canada), Wintershall (Germany), Woodside (Australia)	<b>26(81.25)</b>

Source: EIA (2007)

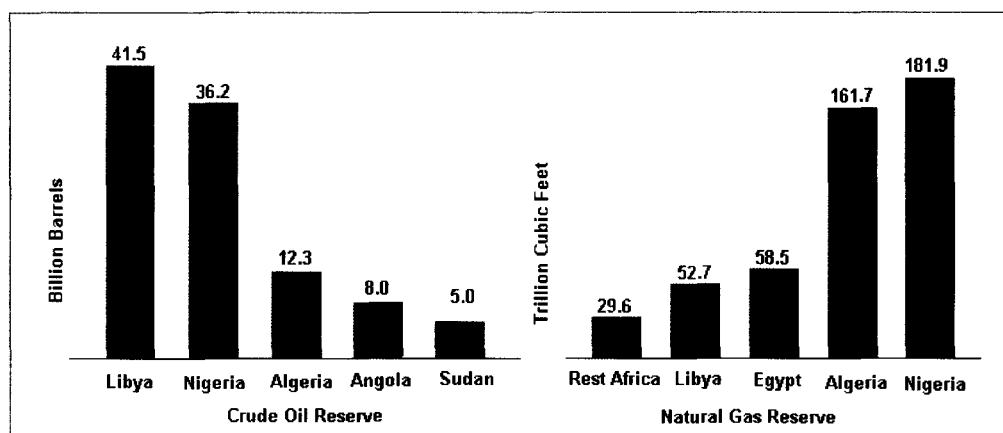


Figure 2.2. Top 5 African proven crude oil and natural gas reserve holders in 2007

Source: EIA (2007)

Table 2.4 shows the main indicators relating to the oil sector in Libya (OPEC, 2007a). These clearly demonstrate that oil and gas together form an essential sector that is worthwhile developing to support the Libyan economy. The development of human resources is a central aspect of this thesis, and can therefore contribute significantly to improving the performance of oil and gas production. Clearly, then the development of the oil industry is essential for the Libyan economy as oil export is considered to be the country's main revenue. One way of improving and developing the oil industry is through the development

of national human resources, and education is top of the Libyan government's agenda to achieve this.

Table 2.4. The production/export value of Libyan crude oil, petroleum and natural gas.

<b>Indicators for 2007</b>	<b>Value</b>
Value of exports (billion US \$)	40.47
Value of petroleum exports (billion US \$)	39.80
Proven crude oil reserves (billion barrels)	43.66
Proven natural gas reserves (billion cubic meter)	1,540
Crude oil production (1,000 barrel/day)	1,674
Marketed production of natural gas (billion cubic meter)	15.28
Refinery capacity (1,000 barrel/day)	380
Output of refined products (1,000 barrel/day)	497
Consumption of refined products (1,000 b/d)	260
Crude oil exports (1,000 barrel/day)	1,378
Exports of refined products (1,000 barrel/day)	183.1
Natural gas exports (billion cubic meter)	9.05

Source: OPEC (2007a).

Oil and gas production is indeed the major foreign trade of Libya, with oil and gas reaching US \$24.3bn in 2006 (The Economist, 2008). The production of Libyan crude oil, for example, increased from an average of 18,200 barrels/day in 1961 to reach a maximum of 33,318 barrel/day in 1970. This then decreased gradually from 1970 until 2007 to reach 1,674 barrel/day (OPEC, 2007b). Similarly, the value of crude oil exports per year gradually increased from US \$16 million in 1961 to US \$21,910 million in 1980, when production was 1,832 million barrel/day, but then the export value of Libyan crude oil showed a gradual decrease to reach US \$11,148 million in 1984 with an average production of 0.985 million barrel/day. It should however be pointed out that the export value showed a fluctuation between US \$12,314 million and US \$9,882 million in 1985 and 2002. The production in 1985 and 2002 was 0.998 and 1.201 million barrel/day, on average. The value of the exports then gradually increased to reach 40,471 million in 2007 with an average 1.674 million barrel/day (OPEC, 2007b). Although Figure 2.3 shows a gradual increase overall in the production

oil industries. The findings of the field study will therefore shed light on the significance of the PTQI as regards the preparation and development of technicians for the oil industries in Libya.

#### **2.4.1- An Overview of the PTQI**

The PTQI was established in August 1970 to supply the oil and gas industries with technicians. This was followed by the establishment of the training and development centre in 1987 to promote a better understanding of the nature of working in the oil and gas industries, with the aim of improving performance. This was achieved through different specialised courses in a variety of fields relating to the oil and gas industries. Each field is run by a specialised department equipped with particular human and physical resources. Generally, there are 11 field of study provided by PTQI. These include drilling, production, processing, mechanics, instrumentation, electronic maintenance, electricity, air conditioning, welding, and industrial safety (PTQI, 2008).

The study duration in PTQI is three years, and the students study different subjects based on their field of speciality, e.g. drilling, production, etc. The first year is a general year where students in the different fields undertake basic subjects such as Chemistry, Physics, Mathematics, languages (Arabic and English), computer studies and IT, as well as other social and political subjects. In the second and third years, the students are required to study specialised subjects in each field alongside different basic courses, including computer studies, IT, and English language. There are up to 60 units of study that the students must complete in the second and third years, which include both theory and practice. In addition, the departments are equipped with the instruments and machines used in the oil and gas industries and the teaching / assistant staff are appropriately qualified: the principal teaching staff all hold B.Sc. and postgraduate degrees (PTQI, 2008).

The PTQI generally accepts 250-300 students a year and the students located nearest to the oil industries all have priority in terms of being admitted to the

1999 and 2007 in most departments. The number of students in the Drilling department, for example, was 17 or 6% of the total number of enrolled students. Similarly, the number of students enrolled in the Mechanics and Instrumentation departments ranged between 17 and 20 and between 19 and 21 students respectively. These constituted between 10% and 12% of the total number of students enrolled in the PTQI for both departments. Students enrolled in the Instrumentation Department decreased from 21 students to 19 students between 1999 and 2007. Similarly, the enrolled students in Industrial Safety department dropped from 29 students in 2002 to 16 students in the years after 2003.

Table 2.5. Number of students by field of study between 1999 and 2007.

		1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Drilling	17	17	17	18	16	16	17	17	17
2	Mechanics	18	18	17	19	18	17	19	19	20
3	Instrumentation	20	21	20	20	21	19	19	19	19
4	Industrial Safety	20	20	29	29	16	16	16	16	16
5	Processing	20	20	20	20	25	25	24	23	26
6	Electricity	23	23	23	25	26	26	26	27	26
7	Air Conditioning	24	24	24	26	26	26	26	28	28
8	Welding	24	24	24	27	27	27	26	28	28
9	Electronic	25	25	25	30	30	30	30	30	30
10	Electronic Maintenance	26	26	26	31	31	31	31	31	31
11	Production	31	35	34	34	36	36	36	37	37
	Total	248	253	259	279	272	269	270	275	278

Data Source: PTQI, 2008

Generally, the Processing, Electricity, Air Conditioning, Welding Electronic, Electronic Maintenance and Production departments all showed an increase in the number of students enrolled between 1999 and 2007 (Table 2.5). Although the PTQI adopted a policy of improvement, even as early as 2002, it is not clear at this stage why these statistics fluctuated between 1999 and 2007 in most

departments. However, between 1999 and 2007, the demand for technicians was influenced by two main factors. The first of these was the UN embargo before 2003, which affected the continuity of development in the oil industries. The second fact may be associated with the changing strategy as regards the market economy in Libya, when various international companies were licensed to explore, produce and export oil and gas. Hence, the number of National Oil Industries involved only 6 companies (18.75%) compared to 26 multinational companies that operated in Libya (see Table 3.2). Here, it is important to note that PTQI graduates can only work in the National Oil Industries.

## **2.5. Summary and Conclusion**

This chapter has summarised the main issues of this study as regards the importance of the oil industries for the Libyan economy. Over the last few decades, Libya has developed its oil sector, despite the UN embargo between 1986 and 2003. In addition to this, the Libyan economy is predominantly dependent on the oil industry, and approximately 95% of the country's exports are crude oil and gas; Libya also has a large reserve of oil and gas. Hence, the policy of the government is to encourage the development of technical human resources in order to undertake and manage the oil industries. This chapter has also focused on the PTQI and its educational indicators between 1999 and 2007. Significantly, the statistics reveal that between 1999 and 2000 there was no significant progress in terms of the numbers of enrolled and graduate students for the 12 departments. This may be related to the market economy, which has encouraged many international oil companies in different fields to invest in the exploration, production and export of Libyan oil and gas. Hence, the modest enrolment figures may have come about because the national oil industries in Libya constitute only 18.75% of the total number of companies in the country (see Table 2.3).

The next chapter will focus on the literature review.



## **Chapter Three**

### **Literature Review**

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#### **3.1- Introduction**

The purpose of this chapter is to address the main aspects relating to education, training and human resources development (HRD). These three terms are closely associated with each other, as both education and training support the development of human resources. As indicated in Chapter 1, the rationale for this research is based on the technical education and training programmes which provide skilled technicians for the oil industries in Libya. This chapter focuses on literature related to the concept of education, training and HRD. However, it is necessary to clarify a number of terms before discussing the interrelationship between the three terms. Generally, education can be classified according to the fields or stages of study. However, technical education focuses on the preparation of students for jobs, which means modernising society. In the last ten years, most countries have gone through a transformation process to cope with the change trends brought about by globalisation, and education is considered an essential part of this modernisation (Maassen and Cloete, 2002).

Education therefore plays a vital role in shaping the oil industry in Libya. Hence, it is generally accepted that there is strong relationship between education, training and human resources development. Clearly, a good standard of education can enhance work performance and job effectiveness in the oil industries. This chapter therefore attempts to rationalise the main points relating to the relationship between the concepts of education and human resources development with special reference to developing countries.

#### **3.2- Clarifying the Terminologies**

Education, technical education, teaching, learning, training, development and human resources are the main terms requiring clarification and discussion in

relation to the aim and objectives of this research. These terms are interrelated, concerning as they do the acquisition of knowledge and skills.

According to Buckley and Caple (2004, p.6) education refers to:

*A process and a series of activities which aim at enabling an individual to assimilate and develop knowledge, skills, values and understanding that are not simply related to a narrow field of activity but allow a broad range of problems to be defined, analysed and solved.*

Different activities often take place in schools that involve teaching and learning specific knowledge according to particular curricula. The concept of formal education encompasses different stages, including a basic one, which is usually compulsory, and an advanced one, which is normally optional. In Libya, education is free right up to postgraduate level. Generally, the educational system is divided into basic education, which encompasses primary, and Secondary school, after which successful students receive a Basic Education Certificate. Secondary school covers a three-year cycle of basic compulsory education and a three-to-four-year intermediate cycle. Formal education in Libya also includes training and education at the basic level to allow students who drop out before completing the full nine years of basic education the opportunity to enrol in vocational programs which are one to three years in length (Clark, 2004). This stage of education, according to the definition of Buckley and Caple (2004), can develop skills in one of the fields of technical and vocational training. Vocational training is centred on 44 different vocations in seven major fields: electrical and mechanical operations; carpentry, building and architecture; inclusive female vocations studies; the service industry; agriculture; marine fishing (Clark, 2004). In addition, higher technical and vocational studies, science, technology and engineering education can be pursued by Libyan secondary school graduates in different institutes, including teacher training institutes; higher institutes for training trainers and instructors; higher vocational centres (polytechnics); specialised higher institutes for technical, industrial and agricultural sciences (Clark, 2004). The Petroleum Training and Qualifying

Institute (PTQI) is one of these institutes and it is at the centre of this study. Education in these institutes provides a theoretical and practical understanding related to a specific field of activity. For example, the PTQI deals with 10 different fields of study relating to the oil industries (see Chapter 2).

Generally, the term 'vocational education' aims to develop occupational or work-related knowledge and skills; it also usually involves training to reinforce particular skills. Alternative terms for vocational education and training that are also used are: technical and vocational education and training; vocational and technical education and training; technical and vocational education; vocational and technical education; further education and training (Knight and Nestor, 2000). The last term is the one most likely to be applied to the PTQI.

Within the concept of education, the processes and activities involved encompass teaching and learning as well as training for technical education. These three aspects are different in their contextual perspectives. Teaching is an instructional process that aims to improve knowledge, skills, attitudes and/or behaviour in an individual in order to accomplish a variety of goals, including long-term personal growth (Kaplan-Leiserson, 2008). In addition, teaching may be considered as being focused on theory and training in addition to practical application. In contrast, learning refers to a cognitive and/or physical process in which a person assimilates information and temporarily or permanently acquires or improves skills, knowledge, behaviour and/or attitudes (Kaplan-Leiserson, 2008). Buckley and Caple (2004, p.5) indicate that the learning process involves acquiring knowledge, skills and attitudes through experience, reflection, study or instruction. In addition, Lynton and Pareek (2000, p.32) refer to learning as a kind of action that involves teaching and learning as a process of cause and effect.

Training also refers to the process that aims to improve knowledge, skills, attitudes and/or behaviour in a person in order to accomplish a specific job task or goal. However, in contrast to the learning process, training is often focused on business needs and is driven by time-critical business skills and knowledge, and its goal is often to improve performance (Kaplan-Leiserson, 2008). In addition,

training involves a planned and systematic effort to modify or develop knowledge, skills or attitudes through a learning experience with the aim of achieving an effective performance in an activity or range of activities (Buckley and Caple, 2004). The purpose of training in the work situation is to enable an individual to acquire abilities so that he/she can adequately perform a given task or job (Buckley and Caple, 2004, p.5).

What is common among these terms is that each involves a process and activity for acquiring knowledge and/or skills in a certain area. In one way or another, acquiring knowledge and skills can lead to the development of staff and subsequently the organisation. As indicated by Kaplan-Leiserson (2008), the term 'development' indicates:

1. Learning or other types of activities that prepare a person for additional job responsibilities and/or enable him/her to gain knowledge or skills;
2. The creation of training materials or courses, as in content development or learning development.

In other words, development involves the enhancement and growth of an individual's skills and ability through conscious or unconscious learning (Buckley and Caple, 2004, p.6). According to UNDP (2008), human development is a process of enlarging a person's capabilities and functions and being creative and productive. Thus, education and the acquisition of knowledge and skills are an essential element for improving and developing human productivities at work. The term 'human development' is holistic, placing people at the centre of all aspects of the development process, while the term 'human resource development' (HRD) refers to organised learning experiences, such as training, education and development, as offered by employers within a specific timeframe to improve employee performance or personal growth. The following two sections therefore focus on the distinction between training and education, and between training, education and HRD.

### 3.3- Education versus Training

As indicated above, the definitions of education and training share the same concepts in a number of associated elements, including knowledge, skills, values and learning. However, education and training are different in terms of the process, orientation, method, content and the degree of precision involved (Buckley and Caple, 2004, p.6). Figure 3.1 illustrates the distinctions between education and training in terms of their processes and effects. In terms of processes, training and education are characterised as being mechanistic and organic.

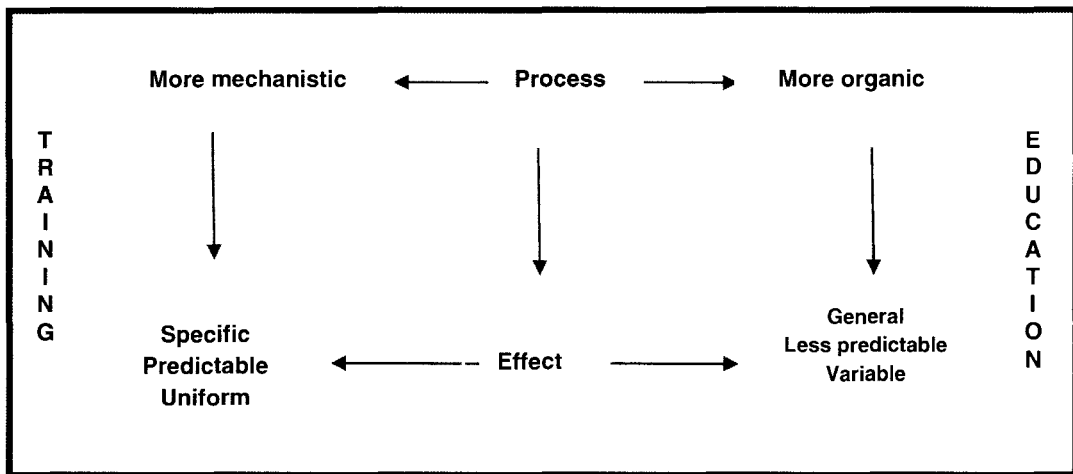


Figure 3.1. The distinctions between education and training are expressed in terms of their processes and effects.

Source: Buckley and Caple (2004, p.7)

The effect of the training process involves uniform and predictable responses to standard guidance and instruction by an individual. In contrast, the education process produces less predictable changes in the individual. In addition, the effect of training to bring about changes is often more immediately observed in the short term, whereas education and development are more likely to show their influence in the longer term (Buckley and Caple, 2004). Training and education are also different in terms of courses or programme content. Buckley and Caple (2004) indicate that training aims to provide knowledge and skills, while education often provides more theoretical and conceptual frameworks designed

to stimulate an individual's analytical and critical abilities. In this context, Carney (2003) argues that training seeks to import a set of established facts and skills. It involves uniform and predictable behaviour from the trainees without the necessity of their understanding why they should act in a prescribed manner. In contrast, education seeks to have the students learn skills and to understand why actions are taken or not. Thus, unlike training, the students must learn to observe, analyse and question, to formulate hypotheses and reach conclusions and then to act, live and modify their actions according to these conclusions (Carney, 2003). Notwithstanding this, education often involves training, especially in the acquisition of factual information.

Previous literature has also distinguished between training and education in terms of the end product. Glaser (1962) indicates, for example, that learning can be specified in terms of particular instances of a student's performance. In contrast, the end-product behaviour for education cannot be specified precisely because it is too complex.

### **3.4- Education versus Human Resources Development**

The definitions in Section 3.2 appear to indicate that that the processes of education and training are closely associated with a number of factors, including knowledge, understanding, skills, attitudes, learning, activities and values. Figure 3.2 depicts the association of these variables with education and training. The collective benefits gained from the process of education and training can directly impact on the performance of human resources. Additionally, training and education may bring about the development an organisation. Hence, any positive changes in these factors due to education and training can also positively satisfy organisational performance, the market and the socio-economic perspectives of the country. As such, the concept of HRD is acknowledged to have a strong functional orientation and it attempts to gain its legitimacy from a range of contributing social science disciplines and applied fields, such as economics, psychology, vocational education and management (Boo, 1997; Manning and Voicu, 2007; Wang and Swanson, 2005, 2008). However, despite the complex

for example, have many activities and processes where great emphasis has been placed on exploring and producing crude oil and gas. Hence, pre-service and in-service training and education are necessary to develop technicians and engineers in Libya so that they can take responsibility for production. The following sections will therefore focus on HRD.

### **3.5- The Concept of HRD**

Defining HRD is no easy task and no single point of view or type of performance for this term has taken precedence (Dilworth, 2003). Consequently, several definitions and frameworks have been put forward in the literature. Some definitions have been concerned with individual and organisational learning, such as that of Stewart and McGoldrick (1996, p.1): *'Human resources development encompasses activities and processes which are intended to have impact on organisational and individual learning'*.

Others authors are more interested in individual and organisational performance. For example, Mclagan (1983, p.7) refers to HRD as

*the integration of training and development, career development and organisation development to improve individual and organisational performance.*

Swanson (1995, p.208) relates HRD to the development of the individual through training to improve performance, this being a *'process of developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance'*.

Swanson (2004) also indicates that the training and development of personnel are conducted for the purposes of improving the performance of the organisation, work processes as well as group and individual levels. He defined organisation development as the process of systematically implementing organisational change to improve performance. In contrast, training and development refer to the process of systematically developing expertise in individuals for the same

ends. Hence, the three critical application areas of HRD are human resource management, career development and quality improvement (Swanson, 2004).

In addition, Watkins and Marsick (1993) related HRD to training, career development, and organisational development, and learning how to organise is an essential part of the organisation's strategy. Training and education is therefore closely associated with the concept of HRD as they enhance the capacity of the organisation's productivity (Becker, 1993; Kuchinke, 2002).

Research has also associated the economic returns of HRD to the human capital theory, investment in education and training, which are presented as a credible explanations for the residual element in the economic growth of nations. Here, HRD can be explained in terms of an increased quantity of physical capital or labour input (Allsopp, 1995). In large organisations, the process of HRD is complex and influenced by different factors, including economic, political and cultural considerations. As such the organisational environment requires a potential harmonisation, support and/or shaping. Figure 3.3 shows the interrelationship between the organisation and the environment. Economic, political and cultural forces can play significant roles in directing the strategically perspectives of the organisation, influencing both inputs and the output.

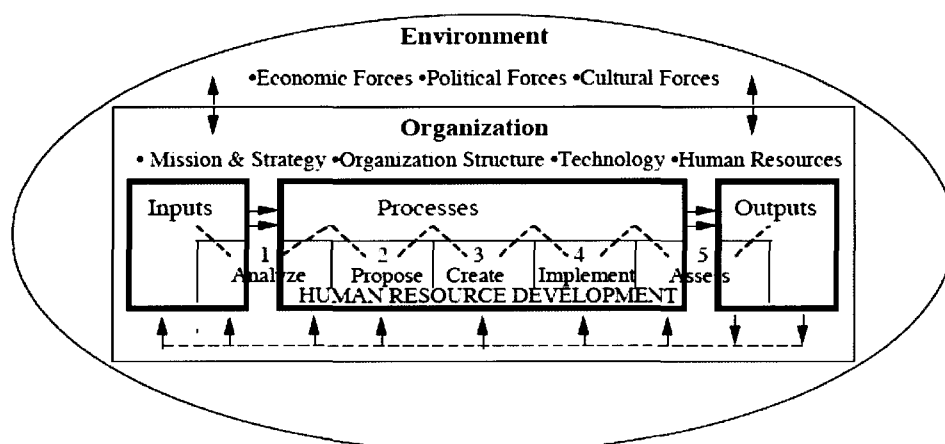


Figure 3.3. Systems World-View Model of Human Resource Development



Along with the development of processes, strategies, ideas and services in the oil sector, one of the keys to the successful delivery of tasks is related to the development of qualified technicians and engineers. Indeed, the development of science and technology has led to the improvement of many companies, in terms of product development and research for the rendering of services. Therefore, HRD is at the centre of these developments and the workforce is the driving force of developments in technology, production, processes and management; here the aim is to achieve a process of discovery and transformation (Rohmetra, 2005; Ronald, 2006; Garcia, 2007).

Swanson (2004) describes the concept of HRD in terms of three core theories: psychological, economic and systems theories. Figure 3.4 uses a three-legged stool to illustrate the relationship between these theories and the performance of the organisational activities. Each leg represents one component theory and the stool's platform represents the integration of the three theories into the unique theory of HRD. The three core theories should involve ethics in setting up standards.

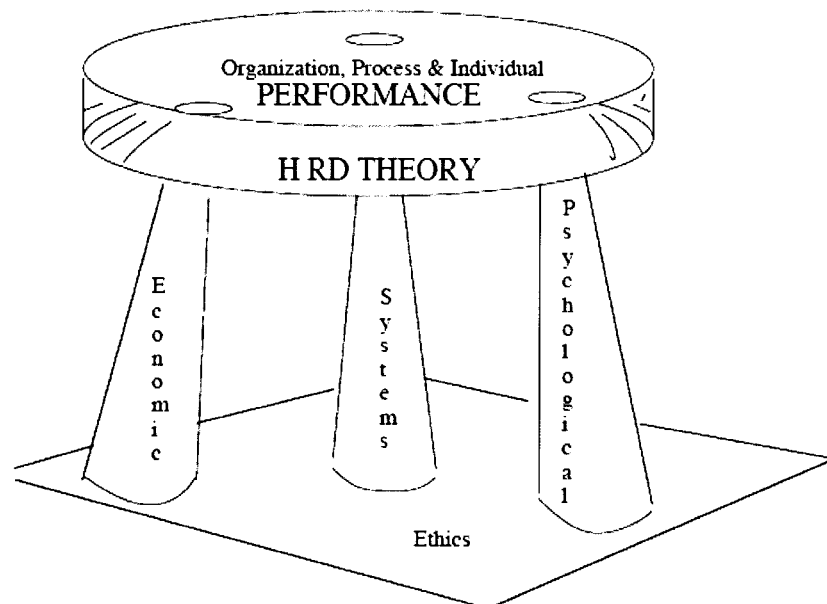


Figure 3.4. The Theoretical foundations of human resource development.

Source: Swanson, 2004

Meanwhile the stool rests firmly on the floor of the host organisation. This represents 'an ethical rug' which filters and maintains the integrity of both HRD and the host organisation. Swanson (2004) associated these three theories with their relevant components. For example, psychological theory is associated with the core human aspects of developing human resources as well as the socio-technical interplay of humans and systems. Economic theory captures the core issues of the efficient and effective utilisation of resources to meet the productive goals in a competitive environment, while the systems theory captures the complex and dynamic interactions of environments, organisations, work processes and group/individual variables operating at any point in time and over time (Swanson, 2004).

### **3.6- Ethics and Work-Based Learning (Al-Tai, 2010)**

Ethics is a set of principles to determine correct conduct. It is a system of moral values and moral choices made by the ethical person. Handling ethical issues is an important element in many academic institutions, in particular when undertaking work-based learning. Academic honesty and project integrity are vital to student's success. Students need to be aware of the skills needed to understand ethical issues. They must adhere to ethics and practices of the further/higher education institution, and the location of their work-based learning in the workplace. Therefore, ethical awareness is important in work-based learning, which requires the consideration of the complicated relationships between the employer, employee and client needs. The learning agreement is beneficial and desirable, and important for all parties and should include the codes of practice required by the professional bodies and how the student responds and adheres to the code. The beneficial side of ethics is to encourage participation at levels in the work place.

Practicing ethics in work based learning helps in the development of ethics to become a discipline. Therefore, ethical procedures must treat the student and employer with respect and do what is right and ethical over factors such as profit.

This involves produce working in a socially and environmentally responsible manner and applying these concepts in the workplace

One of the main conditions for ethics is the confidentiality, which means holding information from an individual or about an individual throughout the professional relationship. It is seen as important to the maintenance of the relationship and the development of trust between individuals. Generally, the following conditions reflect the characteristics of confidentiality:

- Confidentiality does not end. It is owed equally to adults and children, whether or not they are mature.
- Confidentiality is applied specifically to people who cannot make decisions themselves.
- It applies to professional people and students entering their career or profession at each stage of their development
- It applies to all forms of records, whether they be documents or otherwise in any form of media

### **3.7- HRD and Learning**

Human Resource Development is defined as the study and practice of increasing the learning capacity of individuals, groups, collectives and organisations. This is achieved through the development and application of learning-based interventions in order to optimise human and organisational growth and effectiveness (Wilson, 2001). It is also set against a background of turbulence and change in organisational life, in addition to changes in business environments, work processes and organisational cultures, which drive a need for successful change of management strategies. HRD focuses on a wide range of interests, such as organisational concerns, present needs, future challenges, different functions/occupations and a variety of stakeholder interests (Joy-Matthews et al., 2004). Thus, in essence, Human Resource Development practically empowers individuals and groups of individuals to make the most use of their potential and competencies, through formal and informal activities. This can be done, for example, by providing individuals with the opportunity to utilise their competencies, giving them challenging situations and learning new skills

and information for future applications (Grieves, 2003). Therefore, the concept of HRD involves three important points that should be emphasised by an organisation, namely learning, development, and change. Learning and possessing the knowledge of something is one thing but applying that learning is quite another. Hence, learning has limited value unless it is put into practice. Consequently, learning can be defined as a relatively permanent change of knowledge, attitude or behaviour which occurs as a result of formal education or training, or as a result of informal experiences (Wilson, 2001). Development occurs when a gain in experience is effectively combined with the conceptual understanding that can illuminate it, providing increased confidence both to act and to perceive how such action relates to its context. It can be seen from these definitions that development indicates movement to an improved situation; for the individual, this means attaining a physical and mental potential. In fact, in many aspects, development indicates growth and movement by the learner rather than learning itself (Wilson, 2001). Development can also occur through experience or by learning from mistakes and successes (Joy-Matthews et al., 2004). Change, in its simplest sense, is the modification or shift from one situation or condition to another and is usually justified by stability. In addition, it is unlikely to be sustained without the consideration of various emotional, relational and political dynamics; these underpin the organisation of learning and change within specific organisational contexts (Vince, 2004). Based on these aspects, it can be seen that in all three processes, the acquisition of knowledge and learning is involved. Moreover, these three terms can be clearly integrated in the wider scope of Human Resource Development. With such definitions and concepts it is clear that HRD is a fundamental component which should be implemented in organisations, as it is essential for improving the company's processes and products.

In addition, the concept of HRD is related to the concepts of societies, with all the differences and uniqueness of individual countries. It has been reported that society can function properly when it has basic resources, namely natural and capital resources, technology and human resources. This also includes the

number and composition of the population, its level of education, the health status of its citizens and the specific skills and habits that the people have developed. In any given society, all the resources are interrelated, but human resources have a significant influence on the development of all the other resources. Therefore, the multifaceted concept of HRD is related to the development of people living in a given society and through a number of aspects, such as education, training, manpower, planning, healthcare, employment, urban or rural settlements, family planning, migration, and mortality (Leonard, 2006). However, the concept of HRD also pertains to the specific professional development of individuals working in a given organisation, which includes training and development programmes, employees' learning styles, career development, recruitment and selection processes, performance evaluation and practices as well as models, strategic human resources planning, leadership styles (Leonard, 2006). Thus, in this sense, it can be seen that the concept of HRD is similar across all societies and countries, as all societies and countries aim for growth and development. However, despite such similarities, the use of the concept and the different practices and models underlying it, define the type of organisation or society. Hence, differentiating HRD practices and use in different countries would be an effective way of determining the practices and culture of a particular society. This is because the difference in the use of the practices and concepts of HRD of organisations in different countries may predict or determine their success or failure in their respective industries.

### **3.8- HRD in Developed Countries**

An organisation's human resource development or HRD system is a key mechanism for enabling the achievement of business goals through what is considered to be one of the few remaining sources of competitive advantage – people. This is closely tied up with national contextual factors. Hence, political and educational systems play an important role in distinguishing the types and levels of skills available in the labour market, as well as in shaping national values and particular approaches to training and development issues. There is

also substantial evidence to indicate that the national context of an organisation's operations plays an essential role in shaping their practices, regardless of whether there is national ownership of that company. For instance, a study by Tregaskis (1998) suggests that clusters of countries show how organisations in different parts of the world operationalise HRD practices differently because of environmental factors and pressures. In addition, cultural studies also reveal that the peoples of different nations share values, cognitions and behaviour that differentiates them from other nations, and such differences are evident in nationally divergent work values and managerial attitudes. These facts are significant for organisational systems, which are designed to motivate, reward, and develop the people within them (Tregaskis, 1998). In this regard, because the culture of a particular country differs with the cultures of other nations, it can be assumed that the HRD practices and strategies employed by a particular organisation in one country differs significantly from the HRD practices and strategies of an organisation in another country.

In developed western countries, HRD is characterised by stable tendencies and specifics. This is due to the high economic growth, technological development, high living standards and the establishment of new approaches, relating to society management, new organisational concepts, and new theoretical models of individual human beings. Until the end of the 19<sup>th</sup> century, emphasis was laid on economic and capital resources as well as technologies, and not much attention was given to HRD. However, at the beginning of the 20<sup>th</sup> century, the so-called scientific approach to the management of industrial enterprises was introduced, which took production, the means of production, and manufacturing instruments into account. It also stressed the effectiveness of the human labour behaviour. This accounted not only for the economic factors within the industrial sector, but also for human ones– the human personality, its motivation, needs, interests. During the 1970s, the concept of the organisation as a closed and rational unit was dispensed with. Rather, the organisation was seen as an open, dynamic social system, which was constantly changing and developing, and this would require a permanent change and the development of its human resources.

The organic human model was then established, according to which the human being was considered to be a living, organised, growing and developing organism. The cumulative effect of this is a stable social practice (Leonard, 2006). In essence, it can be seen that in the initial stages of the industrial revolution, no emphasis was given to the development of human resources within the organisation. However, after this the management was forced to acknowledge the importance of human resources. Recent research has established that the development of human resources lies in the development of the organisation, and countries such as , America (with other developed countries) have already realised the importance of HRD (Patel, 2005).

From the above information, it is clear that the ingenuity of the concept of HRD (including its practices and strategies) in developed countries can be attributed to its culture, beliefs and practices. Since Western societies are known to be liberal, sophisticated, open-minded and adventurous, it is possible to view their HRD practices and strategies as also being so. Therefore, in order to illustrate and describe the differences of HRD in developed countries, several examples of Western companies will be used; these are companies from Germany, France and the United Kingdom.

One of the most prestigious multinational firms in Germany is AgrEvo, a crop producer and manufacturer that offers tailor-made products to agricultural companies. It has a centralised HRD function and employs 6 professionals who mainly focus on worldwide management development activities. The development of the employees is considered a company-specific responsibility for the decentralised personnel development departments. Moreover, the company's HRD function not only involves working on the development of training topics, learning themes, the development of tools and training courses, but also seeks to fulfil a coordinating role as regards the interpersonal processes within the company. The company uses HRD practices and strategies based on two major objectives. The first of these stimulates and supports potential and personality development and is carried out through the development of

knowledge exchange networks and the implementation of new customer-oriented incentive systems. The other major objective of the company is to foster systematic knowledge management. This involves providing knowledge by documenting and exchanging project experience, creating transparency with regard to competencies and career planning and supporting knowledge-related strategic initiatives, such as worldwide networking and strategic alliances. The most important feature of the company's HRD practice is the fact that employee development in AgrEvo is considered a line responsibility. The HRD department of the company fulfils a mainly consulting and supportive role, while the role of line management is to support employee development. This entails a number of activities, such as promoting employee awareness of organisational objectives, making individual development plans and acting as a coach or mentor. On the other hand, the role of employees is to show commitment and to take the initiative to trigger their own development. In this sense, employees are allowed to become involved in all kinds of organisational change processes and innovations, which can be brought about through planning, design, realisation and evaluation (Tjepkema et al 2002). In this regard, the HRD in AgrEvo (in Germany) places the responsibility of human development on the line management, thereby allowing employees to participate in the decision-making, planning and organisation of their work/ career in the company.

Another example of a company in a developed country is Motorola, which is a well-known American manufacturer of electronic components and telecommunications equipment. In Motorola's decentralised global organisation, each business unit formulates its own HRD policy. Its French facility also employs HRD practices and strategies. This includes a manufacturing and research unit for semi-conductors, a manufacturing unit for automotive electronics and a corporate telecommunications research centre. The main objective of HRD in the Motorola facility of Toulouse is to contribute effectively to its corporate strategy. Furthermore, its major HRD policy theme is the centralisation of all training efforts to obtain a more accurate and overall view of the training investment as well as better strategic control of it. To this end, the



HRD function of the company focuses on the continuous training of the employees with regular discussions between the employees and their supervisors about their respective training needs, as well as recommended training and the evaluation of training results. However, the HR Department of the company also supports its objectives through other forms of learning, including teamwork and new reward systems. Because HRD involves people, the use of HRD in the Toulouse unit of Motorola involves the shared responsibility of its HR Department and the Motorola University. In this sense, its HRD Department acts as a lead unit, having defined training plans in line with the company's corporate strategy and monitoring its implementation. It therefore prioritises training efforts according to the requirements of the company strategy, and fulfils pedagogical roles towards line managers who are responsible for employee development. In this sense, the HRD function of the company helps the managers in their new role as HRD actors. On the other hand, and in line with fulfilling the company's corporate strategy, the representatives from Motorola University provide the different training services and courses requested by the HR department. These include consulting services for both employees and managers in order to define individual learning needs, learning options and individual development. The university has therefore introduced individual professional development plans in its facility, which aims to achieve the best possible fit between the economic needs of the company and the professional development wishes of the employees (Tjepkema et al., 2002). From this, it can be seen that for the Motorola facility in Toulouse, the HR Department and its own University provide the HRD strategies and support needed by the whole company in order to contribute to the effective, efficient development and improvement of its human resources. Thus, the welfare of the employees of the company, in relation to the practices and strategies of HRD rely on the expertise, knowledge, and practical advice of the staff and representatives of the HR Department and Motorola University.

The last example of a company that uses HRD and operates in a developed country can be found in the United Kingdom, with the Rolls-Royce Aerospace

Group. HRD in the company is practiced centrally, as part of the recently renamed human resource function, and is devolved to the business areas through line managers and training coordinators, along with in-house training providers. The company's HR functions provide resources and coordinate formal and informal learning to support the business. In addition, the HRD staff are responsible for creating a learning organisation through their support of the learning process of employees. This includes developing an open learning centre and encouraging older employees to contribute to their own individual learning through personal development plans or diaries. In addition to this, attention is also paid to informal learning. This can be done through on-the-job learning, such as carrying out the job itself, learning through colleagues, training others, taking a first aid certificate, coaching and taking on increased job responsibilities. Aside from the greater opportunities for learning, training, and development, more importantly employees are allowed to take care of their own growth and development in the company through the improvement of ideas. It has been emphasised that employees are involved in terms of their own input and responsibility for continuous learning and development; this requires clarifying their roles and responsibilities, defining what they can expect and determining how they can be supported by the company (Tjepkema et al., 2002). As with the two other companies previously discussed, the Rolls-Royce Aerospace Group also employs a decentralised form of organisation and system, which contributes to the effective and efficient operations of the company.

### **3.9- HRD in Developing Countries**

The tendency to change is typical of HR as a whole, but the dynamics of this change varies according to the country and region. Globally, there is an extremely complicated picture of the condition and dynamics of HRD change. The complexity of HRD arises from the world's differentiation in political, economic, demographic, informational and cultural aspects. In most developing countries, not only are there differences in HRD from one state to another, but

there are also differences within states from one region to another. As a result, HRD has a different status in Western democracies, in the developing world, in the former socialist countries as well as in the countries of the rich North and the poor South (Leonard, 2006). From the definition and perception of a developing country itself, it can be presumed that the HRD practices and strategies here would not be as sophisticated, advanced and open-minded as the HRD practices and strategies of developed or First World countries. For example, an HR problem in the developing world is education and the lack of experts in different social spheres (Leonard, 2006). Hence, in order to discuss and describe the use of HRD in developing countries, the different aspects and factors that affect the organisational management of firms in developing countries need to be stressed.

In terms of the operations and management of organisations in developing countries, a number of critical factors can be identified; these are economic, political, social, environmental, human, and technological factors, and they specifically concern the depletion and deterioration of natural resources, where fertile land is decreased and polluted, and forests, drinking water, oil, and other natural resources are decreasing. As regards economic and political factors, changes in world and domestic markets control the actions and the economic and political conditions in developing countries, particularly with the influence of policies and governmental restrictions. The technological factors here pertain to different means and processes, in line with how the operations and production of organisations take place. Lastly, human resources and social forces include increases and improvements and involve increases in population, healthcare improvements and educational funds (Leonard, 2006). By taking such factors into consideration, it can be seen that the macroenvironment of organisations plays an important part in HRD. More significantly, the organisation's microenvironment and internal affairs also play an essential role in the growth and development of an organisation in developing countries. Additionally, internal affairs dictate the fate of the organisation.

It has been reported that in developing countries, work motivation is a topic of serious concern. This is largely due to flagging worker productivity and chronic organisational inefficiency in the industrially and economically disadvantaged countries. The intensification of competitive pressures on a global scale has further underscored the need for a pragmatic approach to increase productivity and performance in these countries. Two main factors account for the low productivity in many developing countries: one is the obsolete technology and poor infrastructure in such countries, including roads, electrical power, and communication networks; the other is a poorly motivated workforce. However, despite the heavy borrowing of capital and the costly transfer of technology from the developed or First World countries and international financial institutions, organisations in developing countries still continue to be plagued with low worker productivity and performance deficits, causing many organisations to be unviable. Hence, a variety of causal attributions regarding worker motivation and other factors in developing countries have been made, along with suggestions for enhancing employee motivation and creating competitive organisations. Critically, there are widely divergent viewpoints and opinions as to why there is a lack of will to work hard among workers in the developing countries, and these tend to be general in content and sweeping in form (Kanungo and Mendonca, 1994). Hence, in order to provide a discussion that emphasises the differences of HRD in developing countries, a number of examples have been provided.

Although rich in culture and natural resources, India is currently facing a number of problems. These include: political and religious instability; an ever-increasing population; unemployment and poverty; government corruption; castism; an unstable output in agriculture and related sectors; slow privatisation of the bloated public sector; a lack of adequate intellectual property protection; excessive bureaucracy; an increasing gap between the rich and the poor. However, despite such economic problems, the management of organisations in India is changing at a much more rapid pace than ever before, mainly because of the pressures created by the liberalisation of economic policies. Therefore, there is a strong emphasis on HRD in Indian organisations. In fact, in India HRD is

more often used to denote personnel function than HRM. The present HRD system of India is a product of a mixture of social, economic, religious and political factors. Indians are socialised in an environment that values strong family ties and extended family relationships, thereby making them develop stronger affiliative tendencies with a greater dependence on others. Thus, in the work context, interpersonal relations are more relevant, leading them to make job-related decisions based on interpersonal considerations rather than on task demands. In cultural terms, and compared to Westerners, Indians are more fearful of people in power, obedient to superiors, dependent on others, fatalistic, submissive, undisciplined, friendly, modest, unreserved, collectivist, caste-conscious, clan-oriented and law-abiding. Given their daily exposure to scarcity in the economy and an indifferent society in the face of poverty, Indian managers are more inclined to believe in a 'hidden hand' that shapes their destiny and predetermines events. They also manifest a tough resilience in the face of hazards, this being reinforced by an infinite capacity to bear suffering. In addition, the Indian style of human resource management is one that demonstrates an unwillingness to accept organisational change or take risks, a reluctance to make important decisions in work-related matters or a lack of initiative in problem solving, a disinclination to accept responsibility for job-related tasks and an indifference to job feedback. Thus, it can be observed that the development of India's human resources depends on hierarchy and inequality, such as through unequally placed caste and class groups. Indian organisational structures and social relations are therefore hierarchical and people are conscious of status. They also find it comfortable to work in a superior-subordinate relationship, which is personalised. Age matters greatly in India, and seniority can be expected to play a significant role in decisions about promotion and pay. A low masculinity culture can also be observed, which is reflected in a paternalistic management style and a preference for personalised relationships rather than a more divorced performance orientation. This generates a 'tendermindedness' and 'soft work culture' which is associated with a reluctance to take bold decisions and see them through to the end (Budhwar and Debrah, 2001). Thus, in this regard, the

society, culture and religion of Indians are significantly embedded in the use of HRD in Indian organisations.

Another example for developing countries is the use of HRD in Kenyan organisations. However, to be able to discuss its use of HRD, the characteristics of Kenyan organisations must first be described. Kenya has consistently been ranked among the most corrupt nations in league tables, such as those of Transparency International. The Kenyan economy has been plundered through graft and mismanagement. This prevalence appears to have been fostered by an opportunistic approach to appropriating public service gains as well as pressures from the extended family for material support, an uncaring attitude to the utilisation of state resources and weak governance structures. In addition, in terms of its social context, forty different ethnic groups exist in Kenya, each with their own unique language and culture. This can be an important source of diversity, but may also lead to ethnic tensions, tribal clashes, ethnic cleansing, and civil war. The question of ethnicity has therefore impinged heavily on the workplace, and is manifest through favouritism in recruitment, career advancement and the provision of training opportunities. Moreover, work organisations in Kenya emphasise ethnocentrism, traditionalism, communalism, and cooperative teamwork. In a study of teamwork in a Kenyan firm, the first introduction of quality circles failed and the workers only began to accept them when the agenda went beyond quality and productivity and included personal and work-related social problems. Hence, they spent half the time discussing quality problems, while the rest of time was devoted to sharing personal or family problems. The opportunity to confide in each other and seek help and advice from peers created a culture of trust in which they felt more willing to devote their energies to the task at hand, in addition to creating social harmony. This highlighted the fact that Kenyan workers need to allow teamwork to emerge from the social context of work (Budhwar and Debrah, 2001). Thus, the development of human resources in Kenya focuses on teamwork and cooperation among the people irrespective of its high regard for tradition and social status.

### **3.10- HRD and Training**

The ultimate purpose of training is to improve the overall performance of an organisation and this may be driven by the organisation or its employees. However, development is a larger concept that encompasses training and serves as a component of development. This requires a long-term and continuous process of regularly assessing and improving the performance of the employees. Another differentiation with organisations in developed countries is the presence and support of government policies. In Europe, both Germany and France have highly regulated training legislation. German, for example, training policies and standards are the responsibility of the government rather than the employers, with regulation of the dual system making it possible for employers to offer apprenticeship training extremely cheaply. However, this is not the case in Britain, where government policy places the responsibility for training firmly with the employer and the employee within the context of the deregulated training environment. The third factor to be considered is the strong and strategic position of human resources or the HR Department in Western organisations, which significantly contributes to the training and development of company employees; because an HR department has a strong and strategic influence, the concerns and the needs of the organisation are immediately attended to. The fourth factor is the use of effective leadership skills and management; the HR department of Western organisations creates and develops employees with exceptional leadership skills who have the ability to inspire and empower other employees in the organisation. Since employees in Western organisations are more open-minded and not afraid to say what they are thinking, it can be assumed that leaders in Western organisations use participative and consultative leadership styles that provide guidance and coaching to the members of the organisation. This is because it would be hard for leaders in organisations to deal with opinionated and liberal employees, than with inferior employees in developing countries. Thus, communication in organisations in developed countries is likely to be more advanced, and can be considered as a fifth major factor. This is of major significance and determines the success of the use of HRD in developing

countries, for it is through efficient communication that the organisation has the ability to embody its desire to achieve set goals and objectives. Further issues to bear in mind are the economic, political, technological, and social conditions of developed countries. As mentioned in the previous discussion, such factors contribute considerably to the use and development of human resources in a particular organisation. Since developed countries have abundant resources and reserves, they can invest heavily in HRD in a number of ways, such as through training and developmental activities. In this way, organisations belonging to developed countries can provide additional knowledge, learning, development, and change to their company, so furthering their human resources.

However, such factors may be lacking or missing in organisations in developing countries, and these are vital ingredients in the implementation of effective and efficient HRD strategies within organisations. Global changes in international relations affect developed countries the most and such changes lead to the decline of states, the creation of new states, changes in the geopolitical strategies of the great powers and other global changes. Therefore, global changes lead to a widening of the scope of the globalisation process, which, apart from their positive impacts, also have disadvantages for developing countries. Additionally, there are also market changes in national, regional, and world aspects which have a significant influence on HRD. Another factor is that internal political changes in countries play a part for HRD. Demographic changes, migration waves, urbanisation and other forms of settlements related to these are a further significant reason for changes in human resources. Finally, management changes and particularly the management styles of economic organisations, large and small social entities and whole societies have a significant impact on HRD. Technological change may be classified in a different category of factors influencing HRD (Leonard 2006). In addition, the culture and traditions of developing countries play a significant role in the development of human resources. As observed in the previous discussion and the description of HRD practices of both India and Kenya, culture and tradition play an important role in terms of decision-making and job-related activities. Therefore, owing to a



high regard for culture and traditions, too much dependence on them may sometimes be disadvantageous in relation to effective decisions and actions within organisations. Additionally, the stratification of classes and groups of individuals is evident in organisations belonging to developing countries. Here, because employees accept social and class stratification, they are more susceptible to different forms of injustice, inequality, and exploitation. This gives the impression that employees in organisations belonging to developing countries accept that fact that they are inferior to their supervisors, and therefore must be given inferior treatment. However, this is not evident with the majority of employees in developed countries. Hence, this perception contributes to the fact that HRD in developing and developed countries can be deemed to be different from one country to another.

Clearly, pressures affect management objectives, the ways in which enterprises are managed to achieve these objectives, human resource management and industrial relations initiatives. Changes in HR practices, such as increased collective bargaining at the enterprise level, flexibility in forms of employment as well as in working time and job functions have occurred as a result of factors such as stiff competition, rapid changes in products and processes and the increasing importance of skills, quality and productivity. Such factors have also had an impact on HR policies. In managing change, therefore, key elements must include employee involvement in effective change, greater customer orientation, and making sure that the skills of employees are appropriate for the production of goods/provision of services on the global market. Managing people is a way of motivating them to be productive and is an important objective in the management process (Patel, 2005). However, such factors may be missing or lacking in the HRD practices of developed countries. Organisations may not be able to be successful in their respective industries without the help of their human resources. The latter will facilitate the fulfilment of the company's goals and objectives, such as improved quality and productivity, greater flexibility, continuous innovation and the ability to change in order to respond rapidly to market needs and demands. Effective HRD is therefore vital for the attainment of

these goals and improved quality and productivity linked to motivation can be achieved through training, employee involvement and extrinsic and intrinsic rewards. The growing interest in pay systems geared to performance and skills reflects one aspect of the increasing significance of HRD in realising management goals and a gradual shift from collectivism to the individualisation of pay. Here the management's privilege is rediscovered, but in place of commands and control the emphasis is on commitment and control as quality, flexibility and competence replace quantity, task and dumb obedience. Hence, the managerial agenda is increasingly focused on innovation, quality and cost reduction. Additionally, human resource development makes more demands on employees, work is intensified and there is less room for managerial slack and indulgency patterns (Patel 2005).

The interaction of such demands and the economic, political, technological, environmental and social limitations of developing countries somehow serve as a hindrance to organisations in effectively maximising the use of HRD practices and strategies. Hence, the limit in terms of the economic and political instability of developing countries, their limited resources, their increase in population, poverty, lack of education, poor infrastructures, and lack of development of the society serve to contribute to the poor implementation of HRD in organisations. In addition, the high regard of developing countries for their culture and traditions may somehow limit their potential to utilise effectively and efficiently the potential of HRD in terms of the development, improvement, and progress of their companies.

### **3.11- Summary and conclusion**

Chapter 3 focused on the background related to education, training and human resources development. It started with clarifying these terms as well as their relationship. The main distinction between education and training is that the process of education is more organic compared to training as it is more mechanistic. Both are vital for human resources development and both contribute to the inputs/outputs of the organisation. The development of HR in

organisations is influenced by three factors, namely economic, political, and cultural, showing differences between developed and developing countries. From the discussion above, significant differences can be observed in the use of the concepts and strategies relating to HRD. The different examples of organisations in developed countries, reveals several factors that determine or differentiate HRD in developed countries. One important factor for organisations in developed countries is their commitment to training and development. This means that Western organisations have a strong and effective ability to develop people so that the members of their HR Departments can establish an environment where people learn from their own tasks and experiences.

The next Chapter will focus on the methodology.

## **Chapter Four**

### **Methodology: Scope and Rationale**

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#### **4.1- Introduction**

This chapter gives the details of the methodological perspectives in the research for an assessment of the Libyan Technical Education and Training (TET) programme as provided by the Petroleum Training and Qualifying Institute (PTQI). The objective is to explain and discuss how this research project was conducted. As indicated in the previous chapters, the oil industry plays an important role in the Libyan economy and the preparation of human resources in this sector is crucial for the development of technicians. Therefore, research in this field is most likely to support the quality of this programme and highlight the positive and negative issues that can either be substantiated or improved upon. The intention of this research was established in the framework of Chapter 1, Fig. 1.3, and was then expanded on in Chapters 2 and 3.

The research adopted two approaches, namely quantitative and qualitative ones. These two approaches are widely used in social research and employ the questionnaires and the interviews. Three questionnaires and two interviews were designed and developed in order to collect data from the teaching staff, students, PTQI graduates and senior staff in the PTQI and oil industries; these would shed light on the nature of the quality of the TET programme as provided by the PTQI. The development of both research techniques was based on the literature as well as a number of documents obtained from the PTQI.

Generally, research methodology focuses on identifying an unknown through the collection of data (Gall et al., 1996; Neuman, 2000). This kind of methodology constitutes a theoretical study of the logical basis of research for collecting data, elucidating the data and analysing the findings of a field study (Bryman, 1995; Blaxter et al., 2006).

This chapter is therefore composed of the following themes:

- The research concept and techniques
- Research themes
- The research methodology
- The development of the research techniques
- Limitations and ethical issues
- The questionnaire
- Scope of the questionnaire
- The design and development of the questionnaire
- Sample population and responses
- The interview
- Scope of the interview
- The design and development of the interview

#### **4.2- The research concept and techniques**

The literature maintains that research serves as a means of informing other researchers working in the same area; it also enables information to be used to make more effective decisions (Schmitt and Klimoski, 1991). Research should therefore add new information to the existing information in the research area (Blaxter et al., 2006). Research consists of a systematic and objective identification, collection, analysis, dissemination and the use of information to improve decision making as regards the identification and solution of problems (Gilson and Nelson, 2000). Analysing the meaning of research also indicates that it is an organised way of finding answers to questions ([www.experiment-resources.com](http://www.experiment-resources.com)). The concept of research can also be explained since systematic perspectives on research involve a definite set of procedures and steps that have

to be undertaken in order to achieve the most accurate results. Research therefore involves a structure or method within a planned framework of procedures. As indicated in Chapter 1, this research and its characteristics are fundamental to the concepts of the research principals. The basic concept of research involves a valid research problem, an aim, objectives and research questions, all of which should be methodology-led (Blaxter et al., 2006; Gall et al., 1996). The literature also emphasises other characteristics of research: it is driven by a decision, has reliability and validity and is information- orientated (Bell, 1999; Polit and Hungler, 1997; Neuman, 2000; Gratton and Jones, 2004; Blaxter et al., 2006).

Generally, research requires the data to be collected according to a certain methodological approach. Silverman (2006) describes a methodology as the choices made about the cases to study, the methods of data gathering and the forms of data analysis in planning and executing a research study. According to Gratton and Jones (2004), this can be considered from two broad approaches (in terms of the nature of the existing knowledge and the methodological standpoint), namely positivism and interpretism. Gratton and Jones (2004) and Neuman (2000) argue that each approach has differing epistemological and ontological assumptions as well as differing implications for the methodology adopted by the researcher, the data collected and the interpretation of such data.

Research techniques in evaluating educational and technical institution are considered effective means of collecting data and have often been used by different researchers to collect both quantitative and qualitative data (Cohen and Manion, 1994; Bell, 2005; Blaxter et al., 2006). Hence, this research has adopted two approaches to investigate the quality of the TET programme given by the PTQI to prepare Libyan technicians for the oil industries. Additionally, there is no evidence of any previous research in this field in the literature. Hence, the findings here will add new information to the existing literature. Furthermore, this research was designed not only to assess the education and training attitudes adopted in the PTQI, but also to examine the style of coordination between the

PTQI and the oil industries as regards the management of developing and producing skilled people to work in the Libyan oil industries. Therefore, the data would be collected from the all the different and relevant populations concerned. These included the teaching staff, managers and final year students at the PTQI. In addition, data was also obtained from the managers and technicians who had graduated from the PTQI.

In most cases, researchers tend to advocate one approach, but others consider that both qualitative and quantitative paradigms complement each other; this is because each approach has advantages and disadvantages. Using a combination of approaches is also likely to increase the reliability of the research outcomes.

The selection of a particular approach relies upon the philosophy of the research. This establishes the facts that can be collected independently by the researcher, as well as the objectives of the survey methodology and the statistical analysis (Lee, 1992; Bell, 2005; Blaxter et al., 2006; Weinreich, 2009). The literature indicates that research is commonly influenced by a number of factors, including the researcher's interests, assumptions, values, aims and objectives (Lee, 1992; Collins and Hussey, 2003). Moreover, Weinreich (2009) argues that an examination of the quantitative and qualitative paradigms will help to identify their strengths and weaknesses and establish how their divergent approaches can complement each other.

#### **4.3- Research themes**

As already indicated, in order to conduct this research, the researcher considered two approaches: qualitative and quantitative research. Both approaches are essential for gathering primary data (Bell, 2005; Blaxter et al., 2006). The data collection also involved four sample populations to generate the quantitative and the qualitative information. The literature indicates that both approaches are different in their characteristics, purpose, focus and the type of collected data (Driscoll and Tenenbaum, 2005; Blaxter et al., 2006), However,

the main differences between the qualitative and quantitative approaches involve the nature of data. Blaxter et al. (2006, p.199) identified these differences as follows:

*Among these different kinds of data we may recognize a basic distinction between the quantitative (i.e. numbers) and the qualitative (i.e. words and everything else). This distinction has a major influence on how data may be analysed, and also reflects the varied 'traditions', philosophies and practices of different social science disciplines or sub-disciplines. You are almost certain to have examples of both types among your data, though either the qualitative or the quantitative may predominate*

Neuman (2000) and others (Carson, et al., 2001; Collins and Hussey, 2003; Blaxter et al., 2006) describe the qualitative approach as 'soft' data whilst quantitative data is 'hard' data. In addition, qualitative data is represented by words and sentences compared to the quantitative data, which is represented by numbers (Neuman, 2000; Bell, 2005; Creswell, 2009). Moore (2006) also recognises the distinction between the use of quantitative and qualitative techniques for collecting data.

*Qualitative research is concerned with information about things that are less easily understood by counting them - such as the strategies that people who live on low incomes adopt to make their incomes stretch as far as possible, or the attitudes that managers have towards the motivation of their staff. (Moore, 2006, p.104).*

*Quantitative methods collect information about things that you can count - such as the proportion of people in the population who would vote for one political party compared with another, or the number of people in a community who feel strongly about a particular form of public service (Moore, 2006, p.104).*

In addition, Blaxter et al. (2006) describe structured interviews as generally having a non-numerical focus that requires experience. In contrast, the questionnaire provides numerical evidence to support the data collected (Blaxter et al., 2006).



#### **4.4- The research methodology**

Research methodology is considered by many methodologists as an essential part of the research. Its purpose is to gather data which is then used to make assumptions and to analyse and interpret in order to understand the research problem (Cohen et al., 2000; Blaxter et al., 2006; Moore, 2006). Commonly, methodology refers to methods associated with a positivistic model of eliciting responses to predetermined questions or it describes phenomena using particular method(s) (Cohen et al., 2000). Creswell (1998; 2003) refers to methodology as a set of processes, methods and tools as well as being a rationale and espousing philosophical assumptions. Hence, every research project must include a section on methodology. Glazier (1997) examined the difference between the two terms: '*methodology*' and '*method*'. The meaning of *method* comes from the Greek words '*meta*' (meaning 'from' or 'after') and '*hodos*' (meaning 'journey'). Therefore, a method refers to the 'journey or pursuit 'after' or 'some end (Glazier, 1997). Runes (1962, cited in Glazier, 1997, p. 235) refers to method as any procedure employed to attain a certain end. In this research, the end is defined by the collected data using the quantitative and the qualitative approaches. In contrast, the term '*methodology*' refers to the same Greek meaning of '*method*'. According to Glazier (1997), by including the terms 'study', 'theory', or 'principle reason' with the root word of '*method*', we are left with the term '*methodology*', which means '*a study of the plans which are used to obtain knowledge*' (Glazier, 1997, p. 235). Therefore, the term 'method' refers to a specific means of collecting data, and methodology refers to the strategies surrounding the use of the multiple methods of data collection as required by different types of attempts to achieve higher degrees of reliability and validity. In this respect, many methodologists use the term '*triangulation*' to refer to the use of various methods in order to increase validity and reliability (Flick, 1992; Jick, 1978; Bloor and Wood, 2006). In this research, as indicated above, data triangulation refers to multiple sources of data gathering, mainly through different questionnaires and interviews, as illustrated in Figure 4.1.

how something is or exists and relates to a preceding event that has influenced or affected a present condition or event. According to Moore (2006), it is possible to identify a number of different approaches to the design of social research. He stresses that: *'It is not simply a question of which methods are used - the same method can be used in a number of different approaches. Rather, the approach reflects the nature of the subject or issue to be studied'* (Moore, 2006).

The design of both the questionnaires and the interviews were based on the literature relating to technical and vocational education (UNEVOC, 1997). Therefore, the measuring of the performance quality of the PTQI was achieved by assessing the quality of the performance indicators.

As indicated in Chapter 1, the development of the research was based on two approaches: the quantitative and qualitative. The collected data was therefore the information most likely to shed light on the nature of the PTQI's performance and its effectiveness for the Libyan oil industries. The details of the individual approach are therefore discussed in the following sections.

#### **4.6- Limitations and Ethical Issues**

Generally, every research has certain limitations relating to time, finance, sample population and the approval for conducting the field study. Hence, the main limitations in this research project can be summarised as follows:

- Conducting a survey in the oil industries was particularly difficult as the sites are located far away from each other.
- The scatter of the oil industries and both time and financial limitations restricted the number of people in the survey.

However, there were no problems in obtaining permission to conduct the field study in either the PTQI or the oil industries. Many methodologists have emphasised the importance of gaining permission before conducting a survey (Bell, 2005; Blaxter et al. 2006). Therefore, permission was obtained from the PTQI as well as the oil industries and both were sympathetic to the researcher

and assisted with the survey. Along with the covering letter in the questionnaires and the interviews, the researcher made it clear to the participants that all the information obtained would be treated in confidence.

#### **4.7- The questionnaire**

*Questionnaires are one of the most widely used social research techniques. The idea of formulating precise written questions for those whose opinions or experience you are interested in, seems such an obvious strategy for finding the answers to the issues that interest you. But, as anyone who has tried to put a questionnaire together will tell you - and then tried again to interpret the responses - it is not as simple as it might seem (Blaxter et al., 2006, p. 179).*

##### **4.7.1- Scope of the questionnaire**

The scope of the questionnaire encompasses an assessment of the technical education and training programme in Libya for the national oil industry. The questionnaire is considered a natural tool/technique that has questions or items to which an individual can respond (Kerlinger, 1973). It is also a commonly used technique in social and educational research (Blaxter et al., 2006; Moore, 2006). Generally, many methodologists consider the questionnaire an essential technique for collecting data (Cohen et al., 2000; Blaxter et al., 2006; Moore, 2006). For the purposes of this study, three questionnaires were developed in order to collect data from three main sample populations to reflect on the educational process in the PTQI. These were the teaching staff, the students and graduates of the PTQI working in the Libyan oil industries. The three questionnaires had the same concept but were worded differently. Hence, the questions and statements posted to the lecturers, students and technicians were worded according to their academic positions as educators, learners and post-learners respectively. Methodologists in educational research stress the importance of the wording and clarity of the questionnaire (Openpenheim, 1992; Bell, 2005). According to Blaxter et al. (2006), wording questions should not be 'ambiguous' or 'imprecise'. Indeed, in order to obtain reliable data, questions and

statements must be clear and comprehensible. Within this scope, the questionnaire was designed to include both open-ended and closed questions. Indeed, both questions are important for collecting the data and therefore they cover both words and numbers for analysing the respondent's perceptions as well as quantifying them. According to Chin (2006), a big advantage of open-ended questions as a tool for gathering data is that they provide the space for thinking so that the respondents can express their ideas according to the question given by the researcher. This can result in rich information, which supports the analysis and reliability of the gathered information. Openpenheim (1992) indicates that the questionnaire technique provides reliable information because respondents are almost certain to respond to questions explicitly, given that their identity is undisclosed.

The literature identifies a good questionnaire as possessing the following characteristics. It should have clarity, be simple to respond to, have significance, consistency, anonymity and reliability, and the research should not be expensive to conduct (Cohen et al., 2000; Bell, 2005).

#### **4.7.2- The Design and Development of the Questionnaire**

Three different questionnaires were given to the participants [the teaching staff, students and technicians (graduates of the PTQI)]. These questionnaires were designed to include both theoretical and practical issues relating to the academic programme at the PTQI. The three questionnaires encompassed the same 5 main topics: the Quality of the TET programme, the curricula, teaching and learning, educational resources, and the educational planning and assessment. However, as indicated earlier, the statements were expressed differently. According to Moore (2006, p.126), people are likely to respond if they believe the information will be treated in confidence and their names will not be recorded. He also maintains that a covering letter is crucial and indicates that a good covering letter can improve the response rate by ten or fifteen percent (Moore, 2006, p. 126).

Each questionnaire starts with a covering letter and a statement that promises anonymity. This also encompasses two main sections: the independent variables and the dependent variables. The independent variables includes general questions to help identify the respondent's characteristics. Details of the specific independent variables for the sample population are illustrated in Table 4.1.

The second part of the three questionnaires relates to the dependent variables and includes five different areas concerning the academic process and its components. These issues are organised into a further five sections, each containing 12 closed questions and 1 open-ended question. Table 4.2 gives details of the main five sections.

Table 4.1. Independent variables of the sample population

<b>Teaching Staff</b>	<b>Students</b>	<b>Graduates</b>
Occupation	--	Field of work
Qualification	--	--
Age	Age	Age
Work experience in your current occupation	Field of study	Work experience in your current occupation
Previous work experience	--	--

Table 4.2. Main areas of the dependent questions.

Section one	The quality of the technical education and training programme
Section two	Curricula
Section three	Teaching and learning
Section four	Educational resources
Section five	Educational planning and assessment

The measurements of the respondent's perceptions predominantly consisted of the Likert three-point scale (Likery, 1932). The respondents were asked to specify their level of agreement to the 60 statements of the questionnaire. These included the following options:

- Agree (if the respondent was in agreement with the statement)
- Do not know (if the respondent could not make a choice about the statement)
- Disagree (if the respondent was in disagreement with the statement).

The three questionnaires were checked by the supervisor before being translated into Arabic, this being the native language of the respondents. The next step in the development of the questionnaires was an examination for clarity and consistency. Therefore, a pilot study was conducted on the three sample populations. Here, Moore (2006) maintains it is important for the researcher to pre-test the research technique prior to finalising and administration of the research instruments. He indicates that once the questionnaire is distributed, there is no opportunity for the researcher to make corrections (p.127). The first draft of the questionnaires were given to small numbers of the sample (5 teaching staff, 10 students and 10 technicians) who were requested to check the clarity of statements, their relevance to the aim and objectives of this project and their comprehension. The respondents were also asked to provide any comments and/or any suggestions to improve the questionnaire, and hence to obtain reliable data. The responses to the pilot study resulted in a number of comments, mainly related to the syntax in 27 (45%, N = 60) of the statements. Most of these comments were then taken into consideration before finalising the questionnaires.

#### **4.7.3- Sample population and responses**

The three questionnaires were given to all the teaching staff and students as well as the technicians who had graduated from PTQI. These were distributed to the teaching staff by hand, while the students received the questionnaire personally from members of the teaching staff and the technicians received the questionnaire from their companies. Table 4.3 shows the number of distributed and returned questionnaires.

The data was entered in the SPSS to conduct the statistical analyses. This includes a data reliability test, frequencies, percentages and the cross-tabulation between independent and dependent variables. According to Blaxter et al. (2006), reliability refers to how well a research project is carried out. Here, only the results of the reliability test are discussed as the results of the data analysis for the other statistical methods will be discussed in the next chapter.

Table 4.3. Distributed and returned questionnaires by sample populations.

Sample population	Distributed (all staff)	Returned (%)
Teaching Staff	40	26 (74)
Students	240	111 (46)
Technicians	332	210 (63)

Table 4.4 shows the internal consistency of the data according to the individual issues and type of the sample population. An Alpha (Cronbach) test was used to measure the consistency of the individual sections in each questionnaire, and this was based on the average inter-item correlation.

Table 4.4. Alpha (Cronbach) values of responses by teaching staff, students and technicians

	Section	Alpha (Cronbach)		
		Teaching Staff	Students	Technicians
1	The quality of the technical education and training programme	0.712	0.828	0.699
2	Curricula	0.783	0.853	0.795
3	Teaching and learning	0.689	0.863	0.775
4	Educational resources	0.829	0.830	0.776
5	Educational Planning and assessment	0.826	0.888	0.857
6	Overall alpha	0.927	0.962	0.934

The results indicated that the internal consistencies for each section (12 statements) ranged between 0.712-0.826, 0.828-0.888 and 0.699-0.857 for the

teaching staff, students and technicians respectively. In addition, the internal consistencies of responses to the five sections (60 statements) were 0.927, 0.962 and 0.934 for the teaching staff, students and technicians respectively.

#### **4.8- The interview**

*Interview surveys have a great deal in common with self-completion surveys. The large-scale interviewing exercises, like public opinion polls, are really little more than questionnaires administered in person. They require a structured interview schedule with many of the characteristics of a self-completion questionnaire. Semi-structured and in-depth interviews offer the interviewer more scope. These will be therefore dealt with in Chapter 14, 'Collecting Qualitative Data' (Moore, 2006, p. 129).*

##### **4.8.1- Scope of the interview**

The interview is also a common technique for collecting qualitative data. The literature indicates that the interview has both advantages and disadvantages: it is an efficient and effective technique for collecting data and often results in a high rate of return in comparison to the questionnaire technique (Cohen et al., 2000). The literature also refers to the interview as an oral questionnaire, and because of this, further information may be obtained from the interviewees (Cohen et al., 2000). According to Moore (2006), the main advantage of interviews is that the interviewer is able to explore people's responses in ways that are simply not possible with a self-completion questionnaire. Blaxter et al. (2006) indicate that the interview technique involves questioning or discussing issues with people. They therefore list a number of the main options for interviewing people, including face-to-face interviews, or interviews conducted at a distance, e.g. over the telephone or by email. In this research, a structured interview was used to gather information from senior people at both the PTQI and the national oil industries. A set of questions was therefore devised to obtain specific answers (Blaxter et al., 2006). Notwithstanding this, the interview technique may be undermined by the interviewer's attitude, for example, by being



subjective about the interviewee’s responses, and this may create bias in the collected data (Borg and Gall, 1989).

#### 4.8.2- Design and Development of interview

Two interviews were devised in this research: the first was for the head of the PTQI and the heads of the departments and the second was for managers in the national oil industries. Both interviews had the same structure and concepts but were worded differently in the first section. The interviews had three main sections. The first section was composed of 12 questions relating to the strategy of the PTQI and the national oil industries, the plan for student’s enrolment, the coordination between the PTQI and the national oil industries and issues relating to the student’s learning and assessment. The second and third sections had the same wording and formatting and included the use of closed questions.

The second part of the interview involves an assessment of student and trainee knowledge in the following areas: making the right decisions; defining needs; setting objectives; collecting information; work alternatives; identifying alternative solutions; evaluating options; identifying and analysing problems; managing and solving problems; accepting responsibility; dealing with difficulties; engaging in team work.

The third section included questions relating to the management of the delivery of the TET programme by the PTQI in terms of the following issues: coordination; evaluation; responsibilities; planning; the budget; new technologies. The researcher attempted to interview all the managers, the head of the PTQI and the heads of the department at the PTQI. Table 4.5 shows the number and percentages of the interviewees involved in the current study. Regrettably, it was not feasible for the researcher to interview all the senior staff because of their work pressures and their consequent lack of time and availability.

Table 4.5. The number of senior staff interviewed at the PTQI and oil industries.

	Interviewee	Total	Interviewed (%)
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1	Head of PTQI	1	1(100)
2	Head of Departments	10	4(40)
3	Managers	5	3(60)

#### **4.9- Summary and Conclusion**

This chapter focused on the methodology and research design used in the research. Two approaches were used: quantitative and the qualitative research. This was aimed at collecting valid and reliable data. It was hoped that in this way that the disadvantages of the methods used to collect the data would be overcome. Additionally, both the questionnaires and the interviews were designed and developed according to the aim and objectives of the research. The questionnaires and interviews resulted in a moderate to high level of response, with the number of returned questionnaires from the teaching staff, students and technicians being 26 (74%), 111 (46%) and 210 (63%) respectively. A reliability test for the data showed that the overall internal consistency for the three questionnaires was more than alpha = 0.9. Similarly, the responses to the interview were also high with 40% of the heads of departments at the PTQI and 60% of the managers in the oil industries accepting the researcher's invitation for an interview.

The next chapter will focus on the data analysis of both the questionnaires and the interviews.

## **Chapter Five**

### **Data Analysis and Interpretation**

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#### **5.1- Introduction**

The previous chapters emphasised the background of the assessment of the Technical Education and Training (TET) programme in Libya for the oil industry, as provided by the Petroleum Training and Qualifying Institute (PTQI). As indicated in Chapters 1 and 2, the preparation of competent technicians would contribute significantly to the development of the Libyan oil industry, and by extension to the economy of the country. Chapter 3 focused on the theoretical background to the research problem, while the Chapter 4 outlined the methodological approach for collecting the data. Therefore, the first three chapters alongside the methodology chapter triangulate with this chapter. Such triangulation will facilitate an understanding of the research problem from different angles and this will contribute to the analyses and interpretation of the collected data, so providing an overview of the outcome of the research project.

This chapter focuses on the empirical data analyses that were obtained from the questionnaires and interviews; it also considers the presentation and interpretation of the data. The Statistical Programme for Social Sciences (SPSS) was used to analyse the quantitative data. In this way, the questionnaire data was converted into numerical information and analysed by frequencies, percentages and the mean and standard deviation in order to satisfy the purpose of the research project. In addition, the data obtained from the constructed interviews was also analysed, mostly by wording the perceptions of the sample population. As already observed, the use of quantitative and qualitative approaches has become commonplace in social research. The combination of both approaches is therefore not only endorsed, but is often favoured. Thus, the following sections will clarify the responses of the teaching staff, students and technicians in relation to the educational processes conducted by the PTQI.

This Chapter is organised into two parts, the first is an analysis of the data obtained from the three questionnaires, whilst the second part is an analysis of the data obtained from the two structured interviews. Therefore, the chapter is arranged according to the information obtained from both methods, with the aim of answering the research questions.

## **5.2- Research Questions and the Respondents' Perceptions**

As indicated in Chapter 1, this research is based on seeking answers to 8 questions. Two of these questions were addressed in Chapter 3, and here the conceptual distinctions between training and training were elaborated on. In addition, Chapter 3 focused on the importance of education and training for human resources development. There are two questions connected to these issues:

- What is the conceptual distinction between training and education?
- What are human resources and in what setting can education and training contribute to development?

The remainder of the questions relate to an assessment of the potential of the TET programme and an exploration of the nature of the PTQI and oil industries' partnership as regards managing and organising the academic perspectives of the technicians' development and preparing them for the national oil industry. Therefore, in order to answer the main questions, the researcher will focus on presenting and discussing the data obtained from the questionnaires and interviews to highlight how technicians are trained in the Libyan oil industries. The following sections focus on addressing the research questions.

## **5.3- Part One: Quantitative data analysis**

This part is concerned with an analysis of the quantitative data that was obtained from the three questionnaires to measure the perceptions of the teaching staff, the students and technicians. In order to answer the relevant research questions,

the 12 issues in each of the following facets were analysed: the Quality of TET programme, curricula, teaching and learning, educational resources, and educational planning and assessment.

### 5.3.1- What is the demographic setting of the stakeholders?

Since this is the first study of its kind in the field, it was necessary to acquire information relating to the demographic setting of the stakeholder. Therefore, data collected from the three questionnaires was converted into numbers. This was then analysed by the demographic characteristics (the independent variables) of the respondents and their responses to the five sections of the dependent variables.

#### 5.3.1.1- Demographic Characteristics of the Teaching Staff

The demographic characteristics of the respondents indicate that they were all males, the majority (9 or 34.6%) of them belonging to the age group of 46 years or more (Figure 5.1). Other respondents were from the age group of 31-35 years (3 or 15.4%), 36-40 years (3 or 15.4%) and 41- 45 years (5 or 19.2%). Figure 5.2 demonstrates that most of the respondents were lecturers (20 or 76.9%), while the rest (6 or 23.1%) were technicians (Figure 5.2).

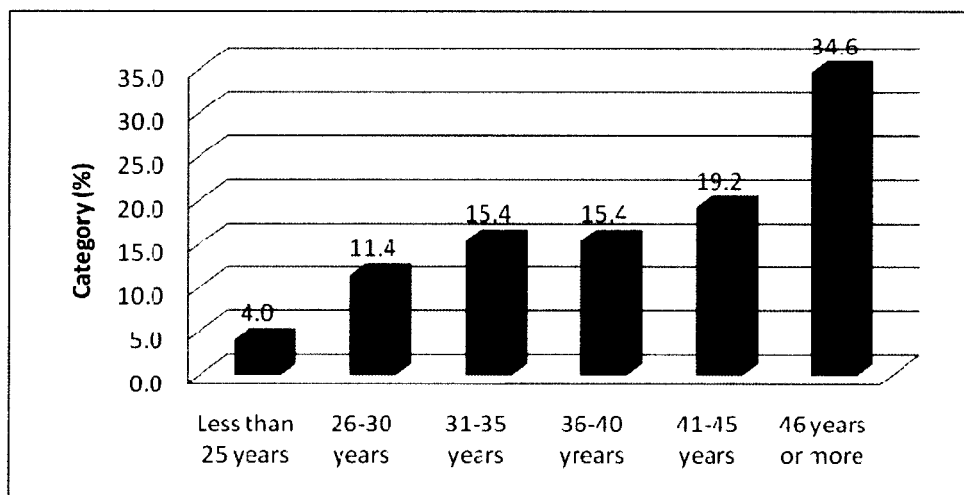


Figure 5.1. Responses according to the age groups of the teaching staff

The majority (16 or 61.5%). of respondents had a BSc degree. The respondents' qualification categories were as follows: 4 (15.4%) were for MSc Engineering, 3 (11.5%) for MSc Science, 2 (7.7%) for BSc Engineering and 1 was a (3.8%) PhD in Engineering.

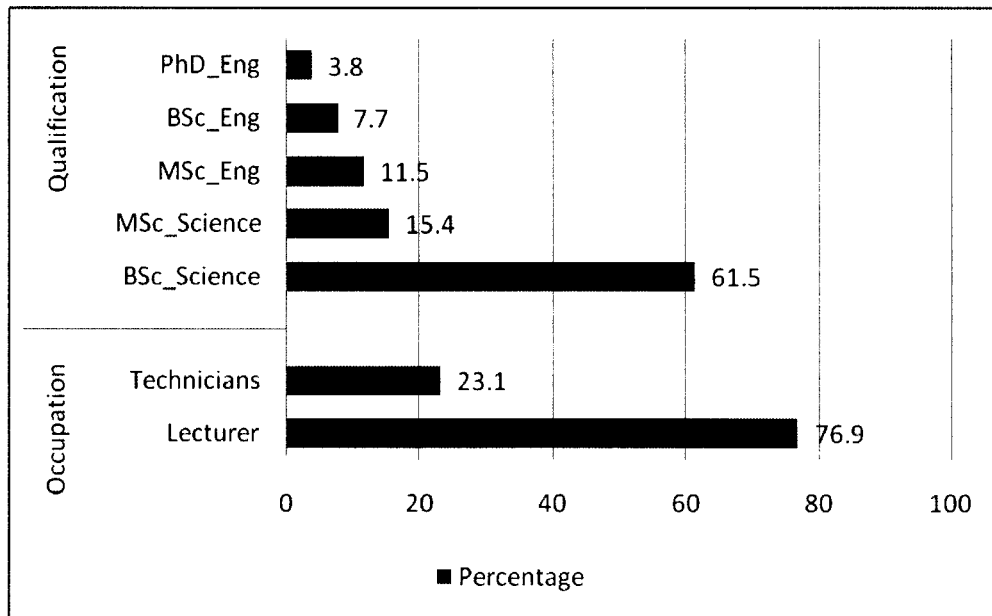


Figure 5.2. Responses according to the qualifications and occupations of the teaching staff.

Figure 5.3 indicates that the majority of the respondents (7 or or 26.9%) had experience of 6-10 years, followed by those with 16-20 years' of experience (6 or 23.1%) and staff with 31 years or more (5 or 19.2%).

The rest of the respondents belonged to the 11-15 years group (1 or 3.8%) or had experience of 1-5 years (3 or 11.5%). In addition, 2 (30.8%) of the respondents had previous experience in the oil industry while 7 (7.7%) had worked in chemical engineering. However, the majority of the teaching staff (13, 61.5%) selected other previous experience, which was mainly in sciences such as Chemistry and Physics.

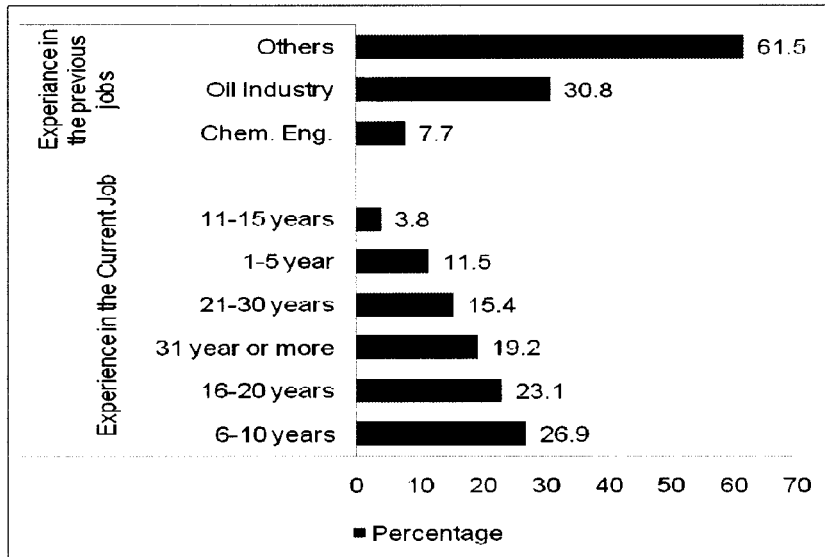


Figure 5.3. Responses according to experience in current and previous jobs.

### 5.3.1.2- Demographic Characteristics of the Students

Table 5.1 shows the vast majority (110 or 99.1%) of the students belonged to the age group 18-24 years. Most of them (83 or 74.8%) indicated that they had studied at the PTQI out of choice. However, 27 (24.3%) of the respondents selected other reasons for studying at the PTQI.

Table 5.1. Respondents by age group and reasons for studying

Age	Frequency (%)
18-24 years	110(99.1)
36-40years	1(0.9)
Total	111(100)
<b>Reason for study</b>	
My desire to study	83(74.8)
Central Admission	1(0.9)
Other	27(24.3)
Total	111(100)

The students responding to the questionnaires were all males and the vast majority of them (110 or 99.1%) belonged to the age group of 18-24 years, while only 1 (0.9%) belonged the 36-40 years' age group. Most students (83 or 74.8%) chose the 'My desire to study' option as the reason for studying at the PTQI, with 1 student (0.9%) selecting the 'central admission' option and 27 (24.3%) selecting 'other'.

Figure 5.4 represents the respondents according to their fields of study, the majority of whom were studying instrumentation (20 or 18%), operations (18 or 16.2%) and electronic maintenance (16 or 14.4%). The rest of the respondents were studying drilling (12 or 10.8%), production (12 or 10.8%) and other fields where the respondents ranged between 5 (4.5%) for mechanical studies and air conditioning to 8 (7.2%) for industrial safety.

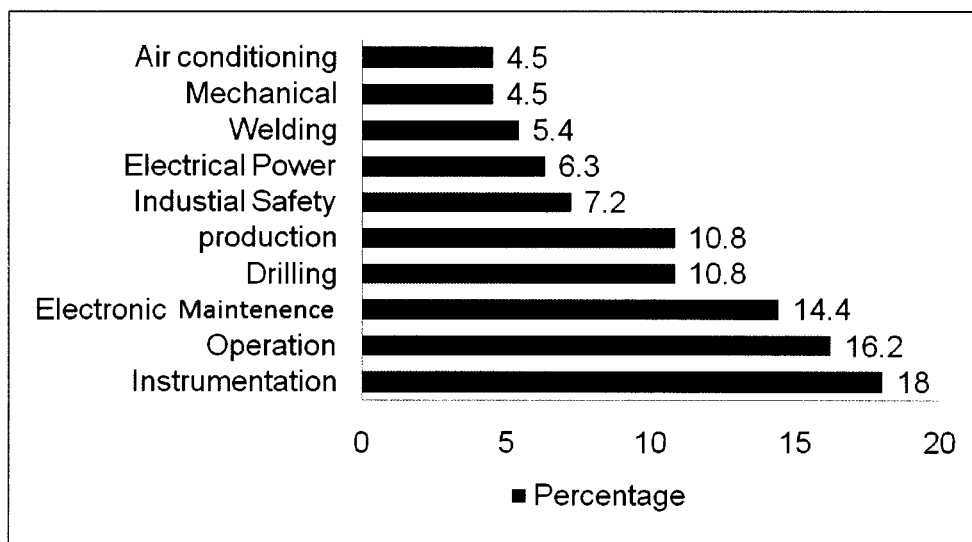


Figure 5.4. Respondents according to their fields of study.

Note: percentages add up to 98.9%, the rest represent the missing values.

### 5.3.1.3- Demographic Characteristics of the Technicians

Figure 5.5 indicates that the majority of the respondents belonged to the 18-24 years' (70 or 33.3%) and 25-30 years' (52 or 24.8%) age groups. The third highest (39, 18.6%) category of technicians belonged to the 31-35 years' age



group. The age groups of 36-40 years and 41- 45 years amounted to 17 or 8.1% technicians individually. The technicians of 46 years or more came to a total of 14 or 6.7%.

Figure 5.6 shows that the majority (45 or 21.4%) of technicians worked in the instrumentation field. 39 (18.6%) worked in the electrical power field, while 35 (16.7%) worked in production.

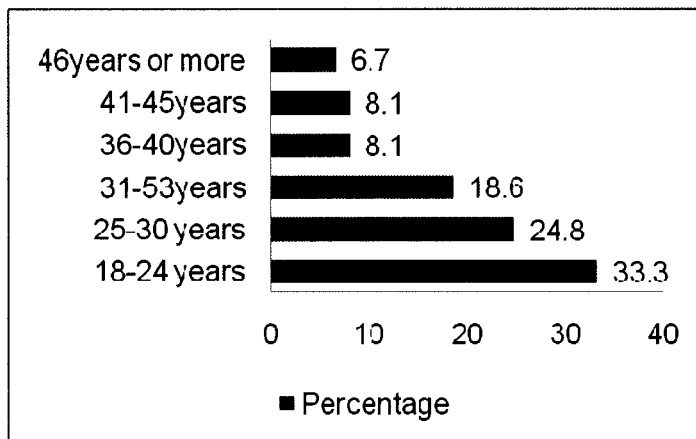


Figure 5.5. Respondents according to age group.

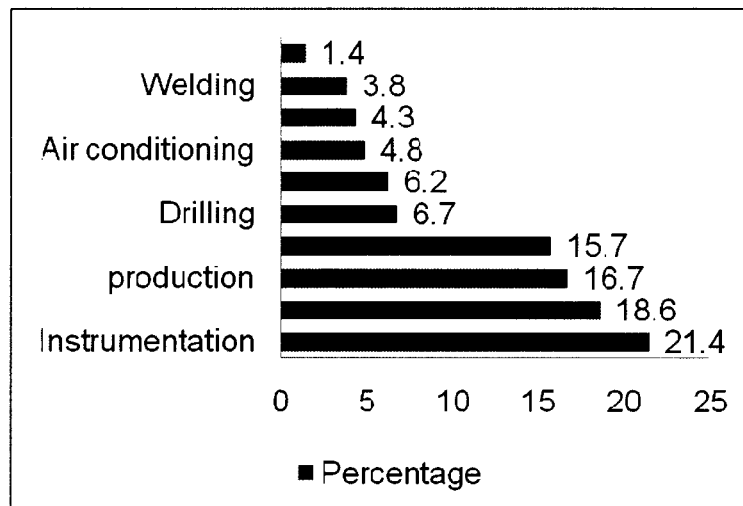


Figure 5.6. Respondents according to their field of work.

Respondents working in the mechanical field added up to 33(15.7%), whilst other responses ranged between 1.4% - 6.7%, these being distributed as follows: drilling (14 or 6.7%), industrial safety (13 or 6.2%), air conditioning (10 or 4.8%),

electronic maintenance (9 or 4.3%), welding (8 or 3.8%) and operations (3 or 1.4%)

Figure 5.7 shows the response distributions according to the years of experience working in the oil industries. The majority of the respondents belonged to the groups with the following periods of experience 1-5 years (69 or 32.9%) and 6-10 years (47 or 22.4%). Respondents with 11-15 years of experience came to a total of 44 or 21.9%. The remainder of the responses were from the following experience groups: 16-20 years (16 or 7.6%), 21-30 years (27 or 12.9%) and more than 30 years (6 or 2.9%).

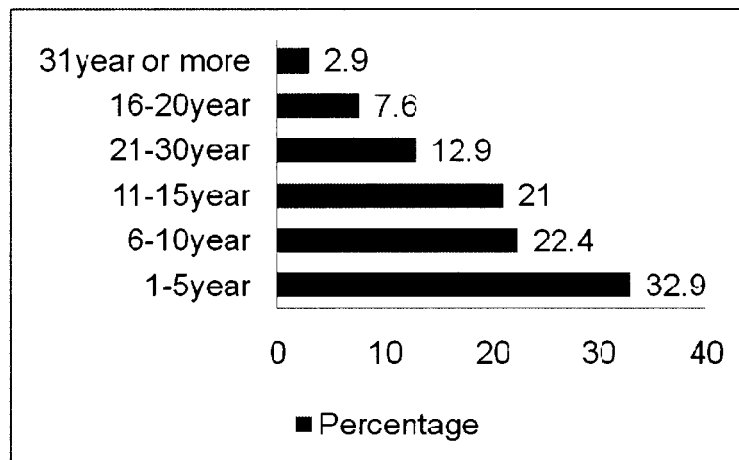


Figure 5.7. Respondents according to years of experience working in the oil industries.

### 5.3.2- What does the PTQI do and in what settings are its activities embraced?

The first research question focused on gathering information about the academic institution (PTQI) in its capacity of preparing technicians for the oil industries. As indicated in Chapter 2, education, the economy and human resources are vital factors in the development of the oil industry. Therefore, the government strategy is to support and encourage the development of technicians in this field. The comments by students indicated that they had chosen to study at the PTQI

because of its advantages. For example, the students receive free accommodation and meals during the course of their studies, in contrast to other students at Libyan universities and in other academic institutions. They are also paid a monthly sum of money, which is non-repayable. In addition to this, after they have graduated they are guaranteed a job and scholarships are available for students who wish to study abroad. An analysis of the information in Chapter 2, indicates that the PTQI covers all the basic areas required to operate in the Libyan oil fields. However, the demographic results indicate that the advantages of further study may encourage students to perform well in order to gain scholarships for further studies. Therefore, the PTQI has arranged to train graduates for BSc and MSc courses with institutions abroad. The course programme involves 4 stages: Higher National Certificate Operations Engineering, Higher National Diploma Manufacturing Engineering, BSc Industrial Engineering and an MSc Degree (PTQI, 2008). This indicates that developing technicians for the oil industries receives attention not only from the government but also from the Libyan Oil Enterprise. However, the Technical Education and Training (TET) programme has also been embraced by students and trainees without official support. Students also acknowledge that there is the opportunity to complete further studies in the future, as one student stated: *'I have applied to the PTQI because after I graduate, I will have the opportunity to study abroad. Most graduates in other Libyan universities graduates do not have this opportunity'*.

According to the requirements of the scholarships, graduates must have high average marks (of at least 80%) (PTQI, 2006). Other students have also commented on why they have applied to study at the PTQI, and their remarks indicate that they also recognise the benefits of studying at the PTQI, particularly after graduation. The following comments by respondents reflect the perception of other students and young people in Libya about studying in one of the oil industry fields:

*A job is guaranteed straight after I graduate.*

*After I graduate, I will have a higher income than other professions.*

*The study duration is shorter but we receive more money compared to other university graduates after graduation.*

*The PTQI has a good reputation and is popular with many secondary school graduates.*

*The PTQI provides a good English course as well as a certificate which can be used to pursue further studies.*

Some students commented on other issues, as follows:

*I believed that the PTQI provides an important step for taking control of the development of the oil industries.*

*The PTQI is good step for the country to embark on so that the oil industry can be developed by Libyan people.*

*The development of the oil industry in Libya by Libyans is good step for undertaking the production of oil.*

*The quality of the education has attracted me to study at the PTQI.*

*I have applied to the PTQI because it offers modern and high standards of teaching.*

*In comparison to other institutes, the PTQI is a more efficient and effective institute.*

These comments provide a good indication of the educational processes of the PTQI and what has been embraced by officials in the oil industries; the results also reflect the good quality of the Technical Education and Training (TET) programme. The next section will therefore clarify the respondent's perceptions in relation to the main issues of the three questionnaires.

### **5.3.3- How do the stakeholders perceive the different issues on the TET Programme?**

In this section, the term 'stakeholders' refers to the teaching staff, the students and the technicians who had graduated from the PTQI. In order to analyse the perceptions of these stakeholders, data was taken from the three questionnaires for 26 (74%) members of the teaching staff, 111(46%) students and 210(63%) technicians. This data was analysed according to its frequency, percentage, mean, standard deviation and Chi-square analysis. The following sections focus on the analysis of the five issues: the quality of the Technical Education and Training (TET) programme, the curricula, the teaching and learning, the educational resources and the educational planning and assessment. An analysis and discussion of the results in the 3 following sections will therefore concentrate on the responses to the 'agree' and 'disagree' options.

#### **5.3.3.1- Quantitative data analysis of the responses by the teaching staff**

The role of the teaching staff is directly associated with the management of the teaching and training programme from the PTQI. The following sections will therefore reveal how the teaching staff perceive the main issues relating to the elements of the educational process.

#### **Teaching staff perceptions on the quality of the TET programme**

Table 5.2 indicates that the majority of teaching staff inclined towards the 'Agree' option on all 12 issues relating to the quality of the Technical Education and Training programme. These results also agree with the students comments set out in the previous section.

Generally, the statistical analysis shows that the level of agreement on this issue ranged between 16(61.5%) and 25 (96.2%). The remainder of the respondents selected the 'Don't know' option. A few respondents (1 or 3.8% - 4 or 15.4%) also disagreed with the following statements: *'The PTQI is keen on developing teaching and training in partnership with the oil industry'* (1 or 3.8%); *'The PTQI coordinates with the oil industries on the quality assurance of the TET*

*programme*' (2 or 7.7%); *'All the graduates trained at the PTQI can be employed by the oil industry'* (3 or 11.5%); *'The PTQI often conducts research to improve the performance in the oil industry or to solve problems'* (4 or 15.4%). The lowest rate of agreement was for providing sufficient advice and scientific/technical support to the oil industries (16 or 61.5%).

Table 5.2. Teaching staff perceptions on the quality of the TET programme

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The PTQI contributes to the supply of a highly qualified workforce for the oil industry	24(92.3)	2(7.7)	-	1.08	0.27
2	The PTQI responds to the oil industries' demands for adequately skilled graduates	24(92.3)	2(7.7)	-	1.15	0.54
3	Studying at the PTQI is popular with secondary school graduates.	25(96.2)	1(3.8)	-	1.04	0.20
4	The PTQI provides competent and skilled graduates who benefit the oil industry.	25(96.2)	1(3.8)	-	1.04	0.20
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry	23(88.5)	3(11.5)	-	1.12	0.33
6	The PTQI meets the demands of the oil industry for technicians.	21(80.8)	5(19.2)	-	1.19	0.40
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.	16(61.5)	9(34.6)	-	1.42	0.58
8	The PTQI ensures that quality of the teaching and training are in accordance with the recruitment policies of the oil industry.	24(92.3)	2(7.7)	-	1.08	0.27
9	The PTQI is keen on developing teaching and training in partnership with the oil industry.	23(88.5)	2(7.7)	1(3.8)	1.15	0.46
10	The PTQI coordinates with the oil industries on the quality assurance of the TET programme .	21(80.8)	3(11.5)	2(7.7)	1.27	0.60
11	All the graduates trained at the PTQI can be employed by the oil industry.	19(73.1)	3(11.5)	3(11.5)	1.36	0.70
12	The PTQI often conducts research to improve the performance of the oil industry or to solve problems.	18(69.2)	3(11.5)	4(15.4)	1.44	0.77

### Teaching staff perceptions on the curricula

Table 5.3 shows that the majority of teaching staff were in agreement with the statements relating to the curricula. The number of respondents who selected the 'Agree' option ranged between 12(46.2%) and 23(88.5%). Significantly, at least one third of the teaching staff did not know how to answer the four statements: *'The curricula provides students with effective coordination skills'* (8 or 30.8%),

*'The curricula keeps abreast of technological advances in the oil industries'* (8 or 30.8%), *'The curricula enables graduates to develop decision-making skills effectively'* (9 or 34.6%); *'The Libyan curricula is highly competitive with the curricula of other countries'* (11 or 42.3%) In fact many of the teaching staff selected the 'Don't know' option (Table 5.3).

Table 5.3. Teaching staff perceptions on the curricula

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The curricula has clear aims and objectives	23(88.5)	1(3.8)	2(7.7)	1.19	0.57
2	The curricula is directly related to graduate needs in practice.	21(80.8)	4(15.4)	-	1.16	0.37
3	The curricula offers graduates the quality of skills required by the oil enterprises	22(84.6)	3(11.5)	-	1.12	0.33
4	The curricula offers graduates skills that are required by and compatible with the oil enterprises.	22(84.6)	3(11.5)	-	1.12	0.33
5	The curricula enables graduates to develop problem-solving skills effectively.	22(84.6)	3(11.5)	-	1.12	0.33
6	The curricula enables graduates to develop decision-making skills effectively.	16(61.6)	9(34.6)	-	1.36	0.49
7	The curricula provides a good educational background for students to progress in their respective fields.	23(88.5)	2(7.7)	-	1.08	0.28
8	The curricula provides adequate training prospects for students to enhance their effective educational learning	23(88.5)	2(7.7)	-	1.08	0.28
9	The curricula provides the students with adequate opportunities to develop an understanding of how their education will assist them in their careers in the oil industry	19(73.1)	4(15.4)	-	1.32	0.63
10	The Libyan curricula is highly competitive with the curricula of other countries	12(46.2)	11(42.3)	2(7.7)	1.60	0.65
11	The curricula provides students with effective coordination skills	17(65.4)	8(30.8)	2(7.7)	1.32	0.48
12	The curricula keeps abreast of technological advances in the oil industries	14(53.6)	8(30.8)	3(11.5)	1.56	0.71

### Teaching staff perceptions on teaching and learning

Table 5.4 indicates that the majority of teaching staff agreed with the statements and the responses for the 'Agree' option ranged between 15 (57.7%) and 25 (96.2%). At least one quarter of teaching staff selected the 'Don't know' option for the following statements: *'Teaching outcomes are assessed and evaluated annually'* (6 or 23.1%) and *'The teaching strategy provides a good basis for*

*predicting how the students will progress in their learning*' (9 or 34.6%). In addition, a number of respondents selected the 'Disagree' option for *'Workshops and practical sessions are often equipped with new technology'* (3 or 11.5%), *'The majority of the students are enthusiastic and interested in the field'* (4 or 15.4%), *'The teaching materials are consistently updated in accordance with new emerging knowledge'* (6 or 23.1%), and *'Teaching outcomes are assessed and evaluated annually'* (6 or 23.1%).

Table 5.4. Teaching staff perceptions on teaching and learning

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The teaching materials are consistently updated in accordance with new emerging knowledge.	15(57.7)	4(15.4)	6(23.1)	1.12	0.33
2	Workshops and practical sessions are often equipped with new technology	17(65.4)	5(19.2)	3(11.5)	1.12	0.33
3	The teaching and learning process is appropriately assessed for every level	19(73.1)	3(11.5)	2(7.7)	1.12	0.33
4	The teaching strategy provides a good basis for predicting how the students will progress in their learning	16(61.5)	9(34.6)	-	1.36	0.49
5	The teaching and learning programme provides opportunities for the students to develop their capabilities as successful learners.	21(80.8)	4(15.4)	-	1.08	0.28
6	The teaching and learning programme provides opportunities for the students to develop their capabilities as confident individuals	21(80.8)	4(15.4)	-	1.0800	0.27
7	The teaching and learning programme provides opportunities for the students to develop their capabilities as effective contributors in dealing with challenges.	22(84.6)	3(11.5)	-	1.3200	0.62
8	Teaching outcomes are assessed and evaluated annually	18(69.2)	6(23.1)	1(3.8)	1.6000	0.64
9	Students receive good support and help from the lecturers	25(96.2)			1.3200	0.47
10	The majority of the students are enthusiastic and interested in the field.	16(61.5)	5(19.2)	4(15.4)	1.5600	0.71
11	The teaching programme has a good balance of theory and practice	22(84.6)	1(3.8)	2(7.7)	1.6400	0.86
12	The teaching programme includes regular field trips to the oil industries	23(88.5)	1(3.8)	1(3.8)	1.4400	0.71

### Teaching staff perceptions on educational resources

Table 5.5 presents the respondent's perceptions on educational resources. In comparison with the previous topics in this section, a number of teaching staff disagreed with more of the statements (see Tables 5.2-5.4). The majority of the teaching staff agreed with the last 4 statements: *'All the resources required for practical or workshop sessions are located in the training institute's buildings'* (22 or 84.6%); *'Lecturers value the academic achievements of the training institute'*



(22 or 84.6%); 'Lecturers take pride in this institute' (21 or 80.8%); 'Lecture and practical rooms are suitably equipped with information communication technology of a good standard' (21, 80%). In contrast, some teaching staff (1 or 3.8% -10 or 38.5%) disagreed with all the statements except for number 11, as the majority of respondents supported the statement 'Lecturers take pride in this institute' (21 or 80.8%) or chose the option 'Don't know'.

Table 5.5. Teaching staff perceptions on educational resources

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The library has good access to electronic journals relating to work in the oil industry.	6(23.1)	9(34.6)	10(38.5)	1.29	0.62
2	The library is a good source of books and documents relating to work in the oil industry.	10(38.5)	6(23.1)	9(34.6)	1.36	0.49
3	Lecturers often use journals and books as resources to update their teaching materials.	13(50.0)	8(30.8)	4(15.4)	1.16	0.37
4	Lecturers often use journals and books as resources for research only.	10(38.5)	6(23.1)	9(34.6)	1.16	0.37
5	Lecturers often encourage students to use journals and books in the library.	19(73.1)	1(3.8)	5(19.2)	1.12	0.33
6	There are adequate copies of the books in the library for use by the students	6(23.1)	11(42.4)	8(30.8)	1.32	0.56
7	Lecturers often recommend new books for the library to purchase.	12(46.2)	6(23.1)	7(26.9)	1.00	0.00
8	The PTQI is completely independent in terms of resources used in the practical or workshop sessions.	17(65.4)	5(19.2)	3(11.5)	1.52	0.77
9	All the resources required for practical or workshop sessions are located in the training institute's buildings.	22(84.6)	21(80.8)	1(3.8)	1.20	0.58
10	Lecturers value the academic achievements of the training institute	22(84.6)	21(80.8)	1(3.8)	1.12	0.44
11	Lecturers take pride in this institute	21(80.8)	4(15.4)	--	2.16	0.80
12	Lecture and practical rooms are suitably equipped with information communication technology of a good standard	21(80.8)	1(3.8)	3(11.5)	1.96	0.89

### Teaching staff perceptions on the educational planning and assessment

Table 5.6 portrays the distribution of responses concerning the statements relating to educational planning and assessment issues. The results show that the majority of teaching staff (13 or 50.0% - 21 or 80.8%) agreed with all the statements. The responses to the 'Don't know' and 'Disagree' options were 2 (7.7%) – 11 (42.4%) and 1 (3.8%) – 2 (7.7%) respectively. The highest rate of agreement among the teaching staff was for the statements 'The PTQI uses

*annual assessment as a method for evaluating teaching and learning progress'* and *'The PTQI regularly reflects on development to set clear goals and targets'*, both of which totalled at 21 (80.8%). There was also a high rate of agreement (20 or 76.9%) for the statements: *'The PTQI is flexible in adopting new teaching techniques'* and *'The PTQI regularly achieves set goals and targets'* (Table 5.6).

Table 5.6. Teaching staff perceptions on the educational planning and assessment

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The PTQI uses annual assessment as a method for evaluating teaching and learning progress.	21(80.8)	3(11.5)	1(3.8)	1.44	0.50
2	The PTQI has adequate plans to improve the effectiveness of the training.	19(73.1)	4(15.4)	2(7.7)	1.64	0.68
3	The PTQI is flexible in adopting new teaching techniques	20(76.9)	5(19.2)	-	1.96	0.37
4	The PTQI regularly reflects on development to set clear goals and targets	21(80.8)	2(7.7)	2(7.7)	1.44	0.47
5	The PTQI regularly achieves set goals and targets	20(76.9)	4(15.4)	1(3.8)	2.08	0.47
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry	19(73.1)	6(23.1)	-	1.80	0.71
7	Assessments within the PTQI correlate well with a career in the oil industry	16(61.5)	8(30.8)	1(3.8)	1.44	0.87
8	In the planning process, the PTQI regularly works with the oil industries	13(50.0)	11(42.4)	1(3.8)	1.16	0.76
9	Additional planning time would allow the PTQI students to use assessment methods more effectively	15(57.7)	10(38.5)	-	1.16	0.82
10	In its educational planning the PTQI is good at adopting techniques from foreign institutes	16(61.5)	3(11.5)	1(3.8)	1.28	0.89
11	Students are adequately consulted for improving the course design	20(76.9)	3(11.5)	2(7.7)	2.00	0.76
12	The PTQI is regularly assessed and inspected by the government to improve its educational planning and efficiency	13(50.0)	11(42.4)	1(3.8)	1.32	0.63

## Summary

Section 5.2.3.1 focused on the descriptive analysis of the perceptions of the teaching staff the five main issues (60 statements) relating to the quality of academic process, curricula and their requirements. The quantitative data obtained from the questionnaire was analysed by frequencies and percentages as well as the mean and standard deviation. The results indicated that the teaching staff were satisfied with the general five issues concerning the quality of the teaching and technical education programme, the curricula, the teaching and

learning, the educational resources and educational planning/assessment. However, a few responses were not in agreement with some of the statements in Tables 5.2-5.4. These are the main areas the teaching staff agreed on: the employment of graduates in the oil industries (3 or 11.5%); research is conducted to improve performance in the oil industries (3 or 11.5%); the curricula is regularly updated (3 or 11.5%); the teaching materials are regularly updated (6 or 23.1%); the workshops and practical sessions are provided with new technology (3 or 11.5%); the students are interested in the field of study (4 or 15.4%). However, there was disagreement on the statements concerning: the use of books and journals for research (9 or 34.6%); encouraging students to use books and journals (5 or 19.2%); the availability of enough copies of the books for the students' use (8, 30.8%); recommendation for buying books (7, 26.9%); the PTQI having enough resources for practical sessions (3 or 11.5%); practical rooms being well equipped (3 or 11.5%).

### **5.3.3.2- Quantitative data analysis according to students' responses**

As the second group of stakeholders, the students were also targeted to give their views on the same issues as those mentioned in the previous section. The perceptions of 111 students regarding educational and training issues are therefore analysed and discussed in the following five sections.

#### **Students' perceptions on the quality of the TET programme**

The students showed similar perceptions towards the quality of the technical education and training programme as the teaching staff (Table 5.7). The respondents agreed (to varying degrees) on the 12 issues, which ranged between 68.5% and 100%. The majority of respondents (90 or 81.1%) agreed that the PTQI is appropriately designed to work competently with the oil industry, while 7 (6.3%) students disagreed with this. The majority (100 or 90.1%) of the students agreed it would be easy to gain employment in the oil industry and held that the course is demanding (78 or 70.3%), but they also believed it provided competent graduates (103 or 92.8%). Hence, the students (76 or 68.5%) considered that the PTQI is a justifiable investment for Libya. In addition, the

students agreed on the remainder of the issues relating to: meeting a balanced demand/supply ratio for the oil industries (88 or 79.3%); the PTQI providing adequate advice and technical support to the oil industries (81 or 73.0%); the institute providing the necessary quality of teaching and training (92 or 82.9%); the PTQI undertaking the development of teaching (93 or 83.8%); the good coordination of the institute with the oil industries (92 or 82.9%); the guaranteed employment of the graduates in the oil industries (89 or 80.2%); the fact that the PTQI helps to improve performance in the oil industries (76 or 68.5%).

Table 5.7. Students' perceptions on the quality of the TET programme

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The PTQI is appropriately designed to work competently with the oil industry	90(81.1)	11(9.9)	7(6.3)	1.23	0.56
2	After graduating from the PTQI it will be easy to gain employment in the oil industry	100(90.1)	5(3.6)	--	1.13	0.43
3	The PTQI course is very demanding	78(70.3)	21(18.9)	10(9.0)	1.38	0.65
4	The PTQI provides competent and skilled graduates ready for work in the oil industry	103(92.8)	3(2.7)	4(3.6)	1.10	0.41
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry	76(68.5)	25(22.5)	9(8.1)	1.39	0.64
6	The PTQI meets the demand/supply ratio balance of the oil industry.	88(79.3)	13(11.7)	8(7.2)	1.27	0.59
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.	81(73.0)	20(18)	9(8.1)	1.35	0.63
8	The PTQI ensures that the quality of the teaching and training are in accordance with the recruitment policy of the oil industry.	92(82.9)	12(10.8)	6(5.4)	1.22	0.53
9	The PTQI undertakes the development of teaching and activities in accordance with the institution's policy.	93(83.8)	7(6.3)	10(9.0)	1.25	0.61
10	The PTQI has good coordination with the oil industries.	92(82.9)	10(9.0)	7(6.3)	1.22	0.55
11	All graduates trained at the PTQI can be employed by the oil industry	89(80.2)	3(2.7)	17(15.2)	1.34	0.74
12	The PTQI often conducts research to improve performance in the oil industry or to solve problems.	76(68.5)	19(17.1)	15(13.5)	1.45	0.72

### The students' perceptions of the curricula

Table 5.8 shows that the majority of students were in agreement on the issues relating to curricula, this agreement ranging between 68 (61.3%) and 90 (81.1%).

Hence, the students concurred on the clarity of the aim and objectives of the curricula (78 or 70.3%) and the curricula correlating with the needs of the oil industries as regards the employment of the students after graduation (80, 72.1%). The students also agreed on other issues relating to the curricula, including the quality of the skills of the graduates (85 or 76.6%), the transportability of the skills for the oil enterprises (81 or 73.0%), the effective development of problem solving skills (84 or 75.7%), the effective development of decision-making skills (89 or 80.2%), the development of the educational background (88 or 79.3%), the provision of training prospects by the curricula (83 or 74.8%), the understanding of career needs as shown in the curricula (79 or 71.2%), the competitiveness of the curricula with other countries (68 or 61.3%, the development of coordination skills (90 or 81.1%) and the curricula keeping abreast of technological advancements in the oil industries (81 or 73.0%). In contrast, between 5 (5.5%) and 24 (21.6%) students disagreed with the topics of Table 5.8.

Table 5.8. Students' perceptions of the curricula

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The curricula has clear aims and objectives	78(70.3)	8(7.2)	24(21.6)	1.51	0.83
2	The curricula correlates directly with the requirements of employment in the oil industry after graduation.	80(72.1)	6(5.4)	24(21.6)	1.49	0.83
3	The curricula offers graduates the quality of skills required by the oil enterprises	85(76.6)	13(11.7)	12(10.8)	1.34	0.67
4	The curricula offers graduates the transportability of skills required by the oil enterprises.	81(73.0)	15(13.5)	14(12.6)	1.39	0.71
5	The curricula enables graduates to effectively develop problem-solving skills	84(75.7)	12(10.8)	13(11.7)	1.35	0.69
6	The curricula enables graduates to effectively develop decision-making skills	89(80.2)	13(11.7)	5(5.5)	1.25	0.54
7	The curricula facilitates the development of an educational background that can be applied to different fields	88(79.3)	7(6.3)	13(11.7)	1.31	0.68
8	The curricula provides adequate training prospects to enhance effective educational learning	83(74.8)	17(15.3)	10(9.0)	1.34	0.64
9	The curricula provides an understanding of a career in the oil industry	79(71.2)	17(15.3)	14(12.6)	1.41	0.71
10	The Libyan curricula is highly competitive with the curricula of other countries	68(61.3)	27(24.3)	14(12.6)	1.50	0.72
11	The curricula facilitates the development of coordination skills.	90(81.1)	8(7.2)	12(10.8)	1.29	0.65
12	The curricula keeps abreast of technological advances in the oil industries	81(73.0)	9(8.1)	19(17.1)	1.52	0.80

The highest responses showing disagreement concerned the curricula aim (24 or 21.6%), the curricula correlating with the needs of the oil industries (24 or 21.6%) and the curricula keeping abreast of technological advances in the oil industries (19 or 17.1%).

### Students' perceptions of the teaching and learning

The students were largely in agreement regarding the teaching and learning issues, with a response of 70 (63.1%) (Table 5.9). The highest number of positive responses from the students (94 or 84.7%) were for the teaching programme and regular field trips.

Table 5.9. Students' perceptions of the teaching and learning

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The teaching materials are consistently updated in accordance with new emerging knowledge	81(73.0)	9(8.1)	19(17.1)	1.43	0.77
2	Workshops and practical sessions are often equipped with new technology	74(66.7)	17(15.3)	19(17.1)	1.50	0.78
3	The teaching and learning processes are appropriately assessed at every level.	76(68.5)	23(20.7)	11(9.9)	1.41	0.67
4	The teaching strategy accurately reflects developments in the field	75(67.6)	23(20.7)	12(10.8)	1.43	0.68
5	The teaching programme provides opportunities for the students to develop skills as successful learners	84(75.7)	12(10.8)	14(12.6)	1.36	0.70
6	The teaching and learning programme provides opportunities to develop confidence within the field	90(81.1)	12(10.8)	8(7.2)	1.25	0.58
7	The teaching and learning program provides opportunities to develop skills in order to deal with challenges in the field.	74(66.7)	24(21.6)	11(9.9)	1.42	0.67
8	Teaching outcomes are assessed and evaluated annually	62(55.9)	33(29.7)	15(13.5)	1.57	0.72
9	The students receive good support and help from lecturers	77(69.4)	6(5.4)	27(24.3)	1.55	0.86
10	The majority of the students are enthusiastic and interested in the field.	70(63.1)	13(11.7)	27(24.3)	1.61	0.86
11	The teaching program has a good balance of theory and practice	84(75.7)	14(12.6)	12(10.8)	1.35	0.67
12	The teaching program includes regular field trips to the oil industries	94(84.7)	8(7.2)	8(7.2)	1.22	0.56

The distribution of responses on the 12 issues for which the students selected the 'Agree' option were as follows: the updating of teaching materials (81 or 73%); workshop and practical sessions equipped with new technology (74 or

66.7%); appropriate assessment of the teaching and learning processes (76 or 68.5%); reflection of developments in the field in the teaching strategy (75 or 67.6%); the development of skills for successful learning (84 or 75.7%); the development of the students' confidence within their respective fields (90 or 81.1%); the development of skills to deal with challenges (74 or 66.7%); the assessment and evaluation of teaching outcomes (62 or 55.9%); good support and help provided to the students by the lecturers (77 or 69.4%); the students' enthusiasm and interest in their respective fields (70 or 63.1%); the good balance of the teaching programme as regards to theory and practice (84 or 75.7%); the inclusion of regular field trips in the teaching programme (94 or 84.7%).

In contrast, some of the students responded negatively towards particular teaching and learning issues, the extent of their disagreement ranging between 7.2% and 24.3%. The highest responses (27 or 24.3%) related to the following issues: the support and help given to the students by the lecturers and the students' enthusiasm and interest in their fields.

### **Students' perceptions of the educational resources**

Table 5.10 indicates that the majority of the students selected the 'Agree' option for the issues relating to educational resources. The lowest responses concerned the availability of books in the library (61 or 55%), while the highest response was for lecturers taking pride in the institute (81 or 73.0%). The distribution of responses for the remainder of the issues are as follows: the availability of electronic journals in the library (67 or 60.4%); the availability of books and documents in the library (77 or 69.4%); the lecturer's use of books and journals to update teaching materials (77 or 69.4%); the lecturer's use of books and journals for research only (59 or 53.2%); the lecturers' encouragement for the students to use journals and books (80 or 72.1%); the lecturers' recommendations for new books to be purchased by the library (67 or 60.4%); the PTQI being completely independent in terms of its resources for practical or workshop sessions (77 or 69.4%); the availability of resources needed for

practical or workshop sessions in the PTQI buildings (67 or 68.5%); the lecturers' value of the institute's academic achievements (72 or 64.9%); the availability and quality of the information communication technology in the lecture rooms (70 or 63.1%). In contrast, between 8.1% to 30.6% selected the 'Disagree' option for the PTQI being completely independent in terms of the resources used in practical or workshop sessions (9 or 8.1%) and the availability of books in the library (34 or 30.6%).

Table 5.10. Students' perceptions on educational resources

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The library has good access to electronic journals relating to work in the oil industry.	67(60.4)	10(9.0)	33(29.7)	1.69	0.91
2	The library is a good source of books and documents relating to work in the oil industry.	77(69.4)	16(14.4)	17(15.3)	1.45	0.75
3	Lecturers often use journals and books as resources to update their teaching materials.	77(69.4)	15(13.5)	18(16.2)	1.46	0.76
4	Lecturers often use journals and books as resources for research only.	59(53.2)	26(23.4)	23(20.7)	1.67	0.81
5	Lecturers often encourage the students to use journals and books in the library.	80(72.1)	14(12.6)	16(14.4)	1.42	0.73
6	There are adequate copies of books in the library for use by the students	61(55.0)	15(13.5)	34(30.6)	1.75	0.90
7	Lecturers often recommend new books for the library to purchase.	67(60.4)	15(13.5)	28(25.2)	1.65	0.86
8	The PTQI is completely independent in terms of its resources for practical or workshop sessions.	77(69.4)	24(21.6)	9(8.1)	1.38	0.64
9	All the resources required for practical or workshop sessions are located in the PTQI's buildings.	76(68.5)	12(10.8)	22(19.8)	1.51	0.81
10	The lecturers value the academic achievements of the training institute.	72(64.9)	22(19.8)	15(13.5)	1.48	0.73
11	The lecturers take pride in this institute.	81(73.0)	17(15.3)	12(10.8)	1.37	0.68
12	The lecture and practice rooms are suitably equipped with information communication technology of a good standard	70(63.1)	11(10.8)	29(26.1)	1.62	0.87

About a quarter of the students who responded to the questionnaire were negative as regards: the lecturers recommending new books to buy (28 or 25.2); the lecture and practice rooms being adequately equipped with information communication technology of a good standard (29 or 26.1%); the library having good access to electronic journals relating to work in the oil industry (33 or 29.7%). Some students also disagreed with the use of journals or books by



lecturers as a resource only (23 or 20.7%) and the availability of equipment in the PTQI (22 or 19.8%).

### Students' perceptions on the educational planning and assessment

Table 5.11 shows that the majority (50 or 54% - 84 or 75.7%) of the students were positive as regards the 12 issues relating to educational planning and assessment.

Table 5.11. Students' perceptions on educational planning and assessment

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The PTQI provides feedback on assessments to improve teaching	80(72.1)	21(18.9)	9(8.1)	1.35	0.63
2	The PTQI has adequate plans to improve the effectiveness of the training	84(75.7)	16(14.4)	10(9.0)	1.33	0.64
3	The PTQI is flexible in adopting new teaching techniques	82(73.9)	16(14.4)	12(10.8)	1.36	0.67
4	The PTQI regularly reflects on developments to set clear goals and targets	77(69.4)	19(17.1)	13(11.7)	1.41	0.70
5	The PTQI regularly achieves set goals and targets	77(69.4)	18(16.2)	14(12.6)	1.42	0.71
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry	81(73.0)	17(15.3)	12(10.8)	1.37	0.68
7	Assessments within the PTQI correlate well with a future career in the oil industry	78(70.3)	19(17.1)	13(11.7)	1.41	0.69
8	Within the planning process, the PTQI is regularly involved in working with the oil industries	66(59.5)	32(28.8)	11(9.9)	1.50	0.68
9	Additional planning time would allow PTQI students to use assessment methods more effectively	76(68.5)	17(15.3)	16(14.4)	1.45	0.74
10	The PTQI is good at adopting techniques from foreign institutes in its educational planning	75(67.6)	19(17.1)	16(14.4)	1.46	0.74
11	Students are adequately consulted for improvements in the design of the course	67(60.4)	12(10.8)	31(27.9)	1.67	0.89
12	The PTQI is regularly assessed and inspected by the government to improve its educational planning and efficiency	50(45.0)	41(36.9)	19(17.1)	1.72	0.74

The distribution of responses with the 'Agree' option is as follows: the PTQI provides feedback on assessments to improve teaching (80 or 72.1%); there are adequate plans to improve the effectiveness of the training (84 or 75.7%); the PTQI is flexible in adopting new teaching techniques (82 or 73.9%); the PTQI reflects on developments in setting clear goals and targets (77 or 69.4%); the PTQI achieves set goals and targets (77 or 69.4%); the PTQI is quick to forecast

and provide feedback on changes in the oil industry (81 or 73%); assessments of the PTQI correlate well with a future career in the oil industry (78 or 70.3%); within the planning process, the PTQI is regularly involved in working with the oil industries (66 or 59.5%); additional planning would allow the students to use assessment methods more effectively (76 or 68.55%); as regards educational planning, the PTQI is good at adopting techniques from foreign institutes (75 or 67.6%); the students are adequately consulted for improvements in the design of the course (67 or 60.4%); the PTQI is regularly assessed and inspected by the government to improve educational planning and efficiency (50 or 45%).

However, the students responded negatively with 27.9% (31) as regards their being consulted for improvements in the design of the course. Further issues in Table 5.11 received between 8.1% and 17.1% responses for the 'Disagree option'.

### **Summary**

This section focused on the perception of the students concerning 5 main areas: the Quality of the TET programme, the curricula, teaching and learning, educational resources, and the educational planning and assessment. The results indicated that the majority of students were in agreement with the 12 issues in each area. The percentage range of the students who selected the 'Agree' option was between 68.3% and 92.8%, 78.7% and 81.1%, 55.9% and 84.7%, 55.0% and 73.0%, 45.0% and 73.9% respectively. This indicated that they were satisfied with the overall academic and training processes at the PTQI. In contrast, there were some students who disagreed with almost all the issues in each area: their responses ranged between 0% and 15.2%, 5% and 21.6%, 8% and 24.3%, 9% and 30.9%, 9% and 27.9% for the main 5 areas.

#### **5.3.3.3- Quantitative data analysis according to the technicians' responses**

The final group of stakeholders to give their opinion on the Technical Education and Training (TET) programme delivered by the PTQI were the respondents who had graduated from the PTQI and are now working in the oil industries as

technicians. Similar questionnaires were put to the technicians with the same concepts as with the two previous types of questionnaires given to the teaching staff and students at the PTQI. This would facilitate a triangulation of the different perceptions concerning the educational and training processes, with the aim of producing competent technicians capable of partially undertaking the development of the Libyan oil industries. The data was derived from 210 technicians working in the oil industries. The following sections therefore relate to an analysis of their perceptions as regards the 5 main areas of the questionnaire.

### **The technicians' perceptions on the quality of the TET programme**

Table 5.12 indicates that the majority of technicians agreed on issues relating to the quality of the TET programmes, their degree of concurrence for the 12 issues ranging from 65.2% to 93.8%.

Table 5.12. Technicians' perceptions of the TET programme

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The PTQI is appropriately designed for competence in work in the oil industry	179(93.8)	8(3.8)	5(2.4)	1.51	0.61
2	After graduating from the PTQI it is easy to gain employment in the oil industry	192(91.4)	10(4.8)	7(3.3)	1.33	0.54
3	The PTQI is a very demanding institute.	176(83.8)	19(9.0)	14(6.7)	1.36	0.59
4	The PTQI provides competent and skilled graduates ready for work in the oil industry	196(93.3)	6(2.9)	8(3.8)	1.34	0.57
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry	196(93.3)	38(18.1)	1(0.5)	1.31	0.54
6	The PTQI meets a balanced demand/supply ratio for the oil industry.	198(90.0)	16(7.6)	5(2.4)	1.51	0.72
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.	157(74.8)	35(16.7)	17(8.1)	1.46	0.71
8	The PTQI ensures that the quality of the teaching and training are in accordance with the recruitment policy of the oil industry.	178(84.8)	25(11.9)	7(3.3)	1.40	0.58
9	The PTQI undertakes the development of teaching and activities in accordance with the institution's policy.	173(82.4)	27(12.9)	10(4.8)	1.51	0.66
10	The PTQI has good coordination with the oil industries.	173(82.4)	32(15.2)	4(1.9)	1.56	0.64
11	All graduates trained at the PTQI can be employed by the oil industry	186(88.6)	10(4.8)	14(6.7)	1.88	0.87
12	The PTQI often conducts research to improve the performance in the oil industry or to solve problems.	137(65.2)	46(21.9)	25(11.9)	1.67	0.63

The results indicate that 179 (93.8%) technicians responded with the 'Agree' option concerning the appropriateness of the design of the educational programme of the PTQI for the oil industry. The majority (192 or 91.4%) also considered it was easy for graduates of the PTQI to gain employment in the oil industries.

### Technicians' perceptions of the curricula

Table 5.13 indicates that the majority (121 or 57.6% to 182 or 86.7%) of technicians agreed with the 12 issues relating to the curricula.

Table 5.13. Technicians' perceptions on the curricula

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The curricula has clear aims and objectives	179(85.2)	23(11.0)	7(3.3)	1.69	0.74
2	The curricula correlates directly with the requirements for employment in the oil industry after graduation.	168(80.0)	33(15.7)	9(4.3)	1.43	0.61
3	The curricula offers graduates the quality of skills required by the oil enterprises	169(80.5)	29(13.8)	12(5.7)	1.63	0.72
4	The curricula offers graduates the transportability of skills required by the oil enterprises	166(79.0)	28(13.3)	16(7.6)	1.58	0.72
5	The curricula enables graduates to develop problem-solving skills effectively.	158(75.6)	40(19.0)	11(5.2)	1.63	0.76
6	The curricula enables graduates to develop decision-making skills effectively.	155(73.8)	38(18.1)	17(8.1)	1.72	0.77
7	The curricula facilitates the development of an educational background that can be applied to different fields	182(86.7)	23(11.0)	3(1.4)	1.72	0.78
8	The curricula provides adequate training prospects to enhance effective educational learning	180(85.7)	23(22.0)	7(3.3)	1.45	0.61
9	The curricula makes provision for understanding a career in the oil industry	169(80.5)	34(16.2)	7(3.3)	1.35	0.64
10	The Libyan curricula is highly competitive with the curricula of other countries	121(57.6)	74(35.2)	14(6.7)	1.22	0.55
11	The curricula facilitates the development of coordination skills.	163(77.6)	40(19.0)	7(3.3)	1.23	0.58
12	The curricula keeps abreast of technological advances in the oil industries	133(63.3)	38(18.1)	39(18.6)	1.45	0.73

The distribution of responses with the 'Agree' option are as follows: the clarity of the curricula's aims and objectives (179 or 85.2%); the curricula correlating with the requirements for employment in the oil industries (168 or 80.0%); the curricula offering the graduates the quality of skills required by the oil enterprises

(169 or 80.5%) and the transportability of skills required by the oil industries (166 or 79.0%); the curricula enabling the graduates to develop problem-solving skills effectively (158 or 75.6%) as well as effectively developing decision-making skills (155 or 73.8%); the facilitation of the development of an educational background that can be applied to different fields (182 or 86.7%); the provision of adequate training prospects to enhance effective educational learning (180 or 85.7%); and the provision for understanding a career in the oil industry (169 or 80.5%); the competitiveness of the curricula with the curricula of other countries (121 or 57.6%); the facilitation of the development of coordination skills (163 or 77.6%); and keeping abreast of technological advances in the oil industries (133 or 63.3%). Nevertheless, 39, or 18.6% of the technicians disagreed with this last issue. Some technicians also disagreed with the same issue in Table 5.13 ranging between 1.4% and 8.1%

### **Technicians' perceptions on the teaching and learning**

Table 5.14 shows the perceptions of the technicians on the teaching and learning process. The majority (48% - 88.5%) agreed on the 12 issues. The distribution of respondents who chose the 'Agree' option for the individual issues are as follows: the continual updating of the teaching materials (118 or 56.2%); the equipping of the workshops and practical sessions with new technology (139 or 66.2%); the suitable assessment of the teaching and learning process (157 or 74.8%); the accuracy of the teaching strategy in reflecting developments in the field (170 or 81.0%); the provision of opportunities to develop skills as successful learners in the teaching programme (184 or 87.6%); the provision of opportunities to develop confidence in the field in the teaching and learning programme (186 or 88.6%); the provision of good support and help by the lecturers (181 or 86.2%); the enthusiasm and interest of the students in their fields (159 or 75.5%), the good balance of the teaching programme as regards theory and practice (173 or 82.4%); the inclusion of regular field trips to oil industries within the teaching programme (186 or 88.6%); the provision of opportunities for the development of

skills to deal with challenges in the field (154 or 73.3%); the annual assessment and evaluation of the teaching outcomes (101 or 48%).

Responses that disagreed with the 12 topics ranged between 1.4% and 16.2%; responses above 10% included the consistent updating of the teaching materials ((29 or 13.8%) and the availability of equipment for the workshops and practical sessions (34 or 16.2%).

Table 5.14. Technicians' perceptions by teaching and learning

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	Teaching materials are consistently updated in accordance with the new emerging knowledge.	118(56.2)	62(29.5)	29(13.8)	1.57	0.72
2	Workshops and practical sessions are often equipped with new technology	139(66.2)	36(17.1)	34(16.2)	1.50	0.76
3	The teaching and learning process is suitably assessed at every level	157(74.8)	43(20.5)	9(4.3)	1.29	0.54
4	The teaching strategy accurately reflects developments in the field	170(81.0)	30(14.3)	8(3.8)	1.22	0.50
5	The teaching programme provides opportunities to develop skills as successful learners	184(87.6)	20(9.5)	5(2.4)	1.14	0.41
6	The teaching and learning programme provides opportunities to develop confidence within the field	186(88.6)	20(9.5)	3(1.4)	1.12	0.37
7	The teaching and learning programme provides opportunities to develop skills for dealing with challenges in the field.	154(73.3)	46(21.9)	9(4.3)	1.31	0.55
8	Teaching outcomes are assessed and evaluated annually	101(48.1)	95(45.2)	13(6.2)	1.58	0.61
9	Students receive good support and help from lecturers	181(86.2)	17(8.1)	11(5.2)	1.19	0.51
10	The majority of the students are enthusiastic and interested in the field.	159(75.5)	39(18.6)	11(5.2)	1.29	0.56
11	The teaching programme has a good balance with regard to theory and practice	173(82.4)	20(9.5)	16(7.6)	1.25	0.58
12	The teaching programme includes regular field trips to oil industries	186(88.6)	9(4.3)	14(6.7)	1.18	0.53

### Technicians' perceptions on the quality of the educational resources

Table 5.15 indicates that the majority (47.1% - 83.3%) of the technicians agreed with the 12 issues but to a lesser extent than with the other issues in this section. Topics relating to the lecturers valuing the academic achievement of the PTQI and their taking pride in the PTQI gained 175 (83.3%) and 177 (84.3%) respectively.

Table 5.15. Technicians' perceptions on educational resources

		Agree (%)	Don't know (%)	Disagree (%)	Mean	SD
1	The library has good access to electronic journals related to work in the oil industry.	99(47.1)	76(36.2)	34(16.2)	1.18	0.46
2	The library is a good source of books and documents related to work in the oil industry.	133(63.3)	63(30.0)	13(6.2)	1.24	0.52
3	Lecturers often use journals and books as resources to update their teaching materials.	106(50.5)	74(35.2)	29(13.8)	1.25	0.55
4	Lecturers often use journals and books as resources for research only.	117(55.7)	63(30.0)	29(13.8)	1.29	0.60
5	Lecturers often encourage students to use journals and books in the library.	112(53.3)	62(29.7)	35(16.7)	1.30	0.56
6	There are adequate copies of books in the library to for use by the students	99(47.1)	68(32.4)	41(19.5)	1.34	0.62
7	Lecturers often recommend new books for the library to purchase	101(48.1)	66(31.4)	42(20.0)	1.14	0.39
8	The PTQI is completely independent in terms of the resources used in practical or workshop sessions.	129(61.4)	67(31.9)	13(6.2)	1.18	0.46
9	All the resources required for practical or workshop sessions are located in the training institute's buildings.	156(74.3)	35(16.7)	19(9.0)	1.23	0.49
10	Lecturers value the academic achievements of the PTQI.	175(83.3)	21(10.0)	13(6.2)	1.49	0.62
11	Lecturers take pride in this institute.	177(84.3)	16(7.6)	16(7.6)	1.26	0.51
12	Lecture and practice rooms are suitably equipped with information communication technology of a good standard.	145(69.0)	35(16.7)	29(13.8)	1.55	0.79

The distribution of responses to the other 10 issues included both agreement and disagreement. The distribution of the responses for the 'Agree' option (with less than 10% disagreement) is as follows: the library contains a good source of books and documents related to work in the oil industry (133, or 63.3%); the lecturers using journals and books for research only (117 or 55.7%); the independence of the PTQI in terms of the resources used in the practical or workshop sessions (129 or 61.4%); the resources needed for practical or workshop sessions being available in the PTQI (156 or 74.3%).

In contrast, although many technicians (99 or 47.1%) selected the 'Agree' option for the library having access to electronic journals related to work in the oil industry, 34 (16.2%) disagreed. Similarly, 106 (50.5%) of them agreed with the issue related to the lecturers using journals and books as resources to update

their teaching materials, while 29 (13.8%) disagreed. The technicians were also divided on the following issues: the lecturers often encouraged students to use journals and books in the library (112 or 53.3% agreed and 35 or 16.7% disagreed); the availability of enough journals and books in the library for the students to use (99 or 47.1% agreed and 41 or 19.5% disagreed), the lecturers often recommended new books for the library to purchase (101 or 48.1% agreed and 42, or 20.0% disagreed); the lecture and practice rooms being suitably equipped with information communication technology of a good standard (agree: 145 or 69.0% agreed and 29, or 13.8% disagreed).

### **Technicians' perceptions on the educational planning and assessment**

Table 5.16 shows only 3 issues with more than 10% of disagreement as the majority were in favour of the statements, including: the fact that the PTQI is quick to forecast and provide feedback on changes in the oil industry (here 130 or 61.9% agreed while 28 or 13.3% disagreed); the assessments of the PTQI correlate well with a future career in the oil industry (138 or 65.7% agreed and 26 or 12.4% disagreed); students are adequately consulted for improvements in the design of the course (here 91 or 43.3% agreed while 67, 31.9% disagreed). The remainder of the issues received more than a 50% positive response rate and a less than 10% negative response from the technicians. The distribution of positive responses for issues relating to the PTQI perspectives were as follows: providing feedback on assessments to improve teaching (113 or 53.8%); the adequacy of the PTQI's plans to improve the effectiveness of the training (146 or 69.5%); the institute's flexibility in adopting new teaching techniques (144 or 68.6%) regularly reflection on development to set clear goals and targets (146 or 69.5%); the PTQI's regular achievement of set goals and targets (151 or 71.9%); the PTQI's regular involvement in working with the oil industries within the planning process (134 or 63.8%); the possibility of additional planning time allowing students to use assessment methods more effectively (121 or 57.6%); the educational planning within the PTQI demonstrating an ability to adopt



techniques from foreign institutes (108 or 51.4%); regular assessment of the PTQI to improve educational planning and efficiency (86 or 41.0%).

Table 5.16. Technicians' perceptions on educational planning and assessment

		Agree (%)	don't know (%)	Disagree (%)	Mean	SD
1	The PTQI provides feedback on assessments to improve teaching	113(53.8)	83(39.5)	12(5.7)	1.09	0.36
2	The PTQI has adequate plans to improve the effectiveness of the training.	146(69.5)	54(25.7)	7(3.3)	1.11	0.41
3	The PTQI is flexible in adopting new teaching techniques	144(68.6)	51(24.3)	12(5.7)	1.22	0.56
4	The PTQI regularly reflects on development in order to set clear goals and targets	146(69.5)	51(24.3)	10(4.8)	1.10	0.41
5	The PTQI regularly achieves set goals and targets	151(71.9)	48(22.9)	8(3.8)	1.19	0.41
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry	130(61.9)	50(23.8)	28(13.3)	1.12	0.40
7	Assessments within the PTQI correlate well with a future career in the oil industry	138(65.7)	44(21.0)	26(12.4)	1.33	0.62
8	Within the planning process, the PTQI is regularly involved in working with the oil industries	134(63.8)	62(29.5)	10(4.8)	1.19	0.47
9	Additional planning time would allow the PTQI students to use assessment methods more effectively	121(57.6)	67(31.9)	19(9.0)	1.22	0.52
10	Education planning within the PTQI is good at adopting techniques from foreign institutes	108(51.4)	82(39.0)	17(8.1)	1.19	0.44
11	Students are adequately consulted to improve the design of the course	91(43.3)	49(23.3)	67(31.9)	1.18	0.53
12	The PTQI is regularly assessed and inspected by the government to improve the educational planning and efficiency	86(41.0)	103(49.0)	18(8.6)	1.46	0.70

## Summary

This section analysed the perceptions of 210 technicians with regard to the Quality of the TET programme, the curricula, teaching and learning, educational resources, and the educational planning and assessment. The majority of the technicians revealed positive attitudes toward topics relating to the 5 areas, these ranging respectively as follows: 65.2 - 90%, 57.6 - 86.7%, 48.1 - 88.5%, 47.1-84.3% and 41.0 - 71.9%. Negative perceptions toward the same issues ranged respectively in the following way: 0.5 - 11.9%, 1.4 - 18.9%, 1.4 - 16.2%, 6.2 - 20% and 3.3 - 31.9%. These results show the general agreement of technician's

perceptions with those of both the teaching staff and students regarding the subjects under examination.

The following sections will focus on the data analysis obtained from the 2 structured interviews.

#### **5.4- Quantitative data analysis using the Chi square**

Cross tabulation and chi square analysis (Table 5.17) are often used to investigate whether variables differ from one another. Therefore, this section focuses on whether the teaching staff, students and technicians differ in their perceptions on particular issues relating to the 5 main topics, namely the quality of the TET programme, the curricula, the teaching and learning, the educational resources and the educational planning and assessment. The cross tabulation analysis of the respondents on issues relating to the 5 main topics are illustrated in Tables 1-60 in Appendix 3.

Table 5.17 shows the chi square values and the significant levels between the 3 respondents. Responses to the quality of the TET programme indicated that although the majority of the respondents agreed on certain issues, they significantly differed on two issues, one concerning the popularity of the PTQI and the other concerning the PTQI meeting the requirements of the oil industry, these results being  $p < 0.036$  and  $p < 0.003$  respectively (see also Appendix 3, Tables 3 and 5). Respondents also showed significant differences in 5 issues relating to the curricula where  $p < 0.003$  and  $p < 0.000$  (Table 5.17; see also Appendix 3, Tables 13, 14, 19, 21, and 23). In addition, the table shows that the respondents differed significantly on more issues relating to teaching and learning ( $p < 0.043$ - $p < 0.000$ , see also Appendix 3, Tables 25, 28, 29, 32, 33, 34, 35) and educational resources ( $p < 0.047$  -  $p < 0.000$ , see also Appendix 3, Tables 37-43, 45-46). Finally, the teaching staff, students and technicians showed significant differences concerning 2 issues relating to educational planning and assessment (Table 5.17, see also Appendix 3, Tables 49, 57).

Table 5.17. Issues that showed significant differences among teaching staff, students and technicians at oil industries

Issues	Pearson Value	df	Asymp. Sig. (2-sided)
<b>Quality of TET programme</b>			
The study in the PTQI is popular with secondary school graduates.	13.511 <sup>a</sup>	6	.036
The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry	19.689 <sup>a</sup>	6	.003
<b>Curricula</b>			
The curriculum has clear aims and objectives	30.134 <sup>a</sup>	6	.000
The curriculum is directly related to graduate needs in practice.	33.240 <sup>a</sup>	6	.000
The curriculum provides a good educational background for students to progress in their respective fields.	20.157	6	.003
The curriculum provides students with the opportunity to develop an understanding of how their education will assist them in their careers in the oil industry	22.848	6	.001
The curriculum provides students with effective coordination skills	21.828	6	.001
Continue .....			
<b>Teaching and learning</b>			
Teaching materials are consistently updated in accordance with new emerging knowledge	23.146	6	.006
The teaching strategy provides a good basis for predicting how students will progress in their learning	20.746	6	.002
The teaching and learning programme provides opportunities for the students to develop their capacities as successful learners	17.866	6	.007
Teaching outcomes are assessed and evaluated annually	14.289	6	.027
Students receive good support and help from lecturers	33.711	6	.000
The majority of students are enthusiastic and interested in the field	33.036	6	.000
The teaching programme has a good balance as regards the theory and practice	13.018	6	.043
<b>Educational resources</b>			
The library has good access to electronic journals related to work in the oil industry	35.236 <sup>a</sup>	6	.000
The library is a good source of books and documents relating to work in the oil industry	29.207	6	.000
Lecturers often use journals and books as resources to update teaching materials	21.500 <sup>a</sup>	6	.001
Lecturers often use journals and books as resources for research only	12.806 <sup>a</sup>	6	.046
Lecturers often encourage students to use journals and books in the library	25.110 <sup>a</sup>	6	.000
There are adequate copies of books in the library for use by the students	22.457 <sup>a</sup>	6	.001
Lecturers often recommend new books for the library to purchase	16.653 <sup>a</sup>	6	.011
All the resources required for practice or workshop sessions are located in the training institute's buildings.	12.748 <sup>a</sup>	6	.047
Lecturers value the academic achievements of the training institute	16.703 <sup>a</sup>	6	.010
<b>Educational planning and assessment</b>			
The training institute uses annual assessment as a method for evaluating the teaching and learning progress.	15.022	6	.002
Additional planning time would allow the institute's students to use assessment methods more effectively	20.562	6	.020

The overall results of the cross tabulation and chi square indicate that the majority of the teaching staff, students and technicians are generally in agreement on issues relating to the 5 main topics, this being consistent with the results in the previous tables above.

## **5.5- Part Two: Qualitative data analysis**

This section concerns the analysis of the qualitative data obtained from the two structured interviews to measure the perceptions of the managers at both the PTQI (5 managers) and in the oil industries (3 managers). As in the previous part, each section will include an analysis of the issues posed to both types of managers, with the aim of addressing the remainder of the research questions.

Managers at the PTQI and oil industries were asked to respond to the various issues relating to the strategy and management of the Technical Educational and Training (TET) programme. In addition, the respondents were requested to give their opinions on admissions, coordination, training and graduate competence as well as effectiveness. Therefore, this section is organised to clarify how the interviewees perceived the various aspects of strategy relating to the TET programme, coordination knowledge and skills.

### **5.5.1- How the top management in the PTQI and oil industries perceive strategies being addressed to embark on the TET Programme?**

As indicated in Chapter 1, the purpose of the TET programme is to provide the oil industries with competent technicians. The respondents therefore agreed on the importance of producing qualified technicians to undertake the development of the oil industries. Both groups work on the development and improvement of human resources to deliver the TET programme effectively and efficiently. Therefore, this programme is considered a key element in the development strategy of the technical education for achieving competent human resources development and thereby taking responsibility for improving the oil industries in Libya.

Both the PTQI and the oil industries are working under the umbrella of the Libyan National Enterprise for Oil (LNEO) and therefore follow the strategy of the LNEO. The LNEO emphasises the importance of technical education and training and develops the knowledge and skills of the PTQI graduates as a key element of the strategy for developing competent technicians for the oil industry with the aim of

improving and developing the structure of the oil industries in Libya. The mission, according to one manager in the oil industry is based on continuous training to produce highly competent technicians who can undertake tasks for the oil industries effectively. The results indicate that the strategy is mainly related to this development of technicians for the oil industries and hence the oil industries have become more independent in developing the oil sector in Libya, i.e. the Libyan oil industries are no longer reliant on the international workforce to extract the crude oil (including the exploration, operation and production). One manager outlined the following goals for the strategy of the TET programme:

- to obtain qualified technicians and engineers
- to increase the competency of human resources through training with new technology.
- to substitute overseas technicians and engineers with the national workforce
- to invest in modern technology so it can be operated by the national workforce

Therefore, the respondents believed that in order to support the strategy of the TET programme, it is essential for both the provider and user of this programme to maintain a high level of collaboration, with the aim of keeping pace with the development of the oil industries. In this respect, the results of the interviews indicate that continuous training and assessments of the technicians' effectiveness are an essential element in the development of the oil industries. A few managers emphasised the volume of theory in preparing technicians at the PTQI and their consequent concentration on practice after graduation. Hence, the gap between theory and practice should be narrowed to support decision-making processes and the general competence of the technicians; as one manager stated:

*The continuous work on strengthening the collaboration with the staff at PTQI and putting them in the picture as regards what the oil industry needs would most likely to contribute to developing the work in the oil industries (A manager in an oil industry).*

A number of managers indicated that the PTQI is responsible for delivering the strategy of the TET programme, as it is more concerned with education and training, while the involvement of the oil industries is limited to specifying their requirements, mainly as regards the number of students being admitted. Other respondents indicated that part of the strategy for the TET programme involved raising the standards of the educational and training programme in order to maintain the development of the oil industries at a high level. Thus, the strategy of the PTQI and oil industries includes the continual support of the PTQI on the one hand, and increasing the level of coordination between The PTQI and the oil industries on the other.

In addition, the managers responded to the methods of the development of the strategy. They indicated that training is being developed by setting up the programmes in the oil/gas field; one manager stated:

*We use two methods for the development of our training programmes: in the first we take students and trainees to the oil/gas field, and with the second, we invite training companies to train students and technicians in the field.*  
(Manager in the PTQI)

A manager from the oil industry indicated that the development of the strategy for the TET programme was discussed with the staff at the PTQI:

*Effort is continuously being made to emphasise the weaknesses of our workforce to the staff in the PTQI and put them in the picture about what is required to improve their performance in order to close the technical gap* (Manager in the oil industry).

Discussions were regularly held by the managers in both the PTQI and the oil industries during monthly meetings. The results of these interviews indicate that during the meetings various issues were discussed, including the progress of the education and training and the weaknesses of the technical competence of technicians. As one manager from the oil industries stated: *'From time to time we*

*assessed the technicians' competence and discussed it with the manager at the PTQI, with the aim of planning how to improve efficiency in the oil/gas fields.'*

Another manager indicated that discussions on improving the technicians' standards at work would also take place when new equipment arrive. The initial training is often conducted by the companies supplying the equipment and machines to the oil industries, but this training usually involves engineers and staff from the PTQI. Subsequently, the PTQI teaching staff train the students and this carried out at the PTQI. Technicians also receive training on the new equipments by the engineers in the oil industries. This process should have a positive impact on the training strategy, as one manager stated:

*The continuous progress in training, whether for engineering staff or technicians, should have a positive impact on work performance in the oil industries. This is mainly important when new machines and equipment are to be used in the oil industries. (Manager in the oil industry)*

Therefore, continuous meetings and planning sessions are considered to be main priorities in collaborating with the PTQI staff in order to improve the delivery of the TET programme.

*Working together with the staff at the PTQI and continued meetings for the preparation of the educational and training plans should encourage the development of the TET programme to improve the effectiveness of the oil industries' workforce. (Manager in the oil industries)*

In addition, the results of the structured interviews indicate that the majority (7 or 87.5%) (Table 5.17) of the managers agreed about the involvement of both the PTQI and the oil industries in planning student admissions, this being one of their coordinating activities. According to one manager, the PTQI graduates are the main technicians required by the oil industries. The number of admitted students to the PTQI is therefore agreed on with the PTQI. This issue was explained by one manager who reflected the views of many of the others:

*The number of students admitted to the PTQI is specified by each oil industry and according to the capacity of the PTQI. The graduates are automatically taken by the oil industries according to their field.*

The majority of managers also agreed that the oil industries employ all the PTQI graduates (6 or 75%) and the institute provides training to the technicians and engineers. However, it is not clear why some managers responded negatively. This may be due to the fact that a number of graduates are either employed at the PTQI or they continue to study for a BSc in engineering at one of the Libyan universities or abroad. Few managers indicated that the PTQI graduates are automatically employed in the oil industries after graduation. In addition, all the managers showed that the PTQI strategy involves the training of technicians and engineers (Table 5.18). The results also reveal that the training is conducted in accordance with the requirements of the oil and gas industries. In this respect, and according to a number of managers, there are two types of training, namely regular training and planned training. The PTQI provides regular sessions for the technicians of the oil industries, which usually take place once a year. The purpose of these sessions is mainly to refresh knowledge and consolidate skills. The second type of training is associated with the installation of new machines, instruments or techniques related to the oil industries.

These results indicate the satisfaction of the majority of respondents for three issues: the student admissions, the employment of the students in the oil industries and the training of the technicians and engineers at the PTQI.

Table 5.18. Managers' responses on student issues.

		Yes (%)	No (%)
1	Does the PTQI involve the oil industries in planning the student admissions for the first year as part of their coordination activities?	7(87.5)	1(13.5)
2	All the PTQI students start their work in the oil industries after graduation?	6(75)	2(25)
3	Does the PTQI strategy provide training to technicians and engineers?	8(100)	0(0.0)



For many managers at both organisations, the development of human resources in the oil and gas industries is considered as an essential investment; one manager declared:

*The LNEO spends large amounts of money on the development and running of the TET programme for producing and developing technicians in the oil industries. Therefore, this programme in the development of human resources for the oil and gas industries is a good investment.*  
(Manager at the PTQI)

#### **5.5.2- How far does the coordination of the PTQI and the oil industries benefit the development of competent technicians?**

Results for the majority of responses to the questionnaires clearly indicated the existence of coordination between the PTQI and the oil industries on a variety of issues with the aim of raising the standards of the technicians' competence. It appears that the coordination between the provider and the user of the TET programme is aimed at actively developing the oil and gas industries in Libya. According to a number of managers, coordination between the educational and industrial sectors is vital for the country's economic progress. This view was expressed by a manager in one of the oil industries:

*The development of the oil and gas industry is vital for the Libyan economy, which mainly depends on oil revenue. Therefore, coordination between the PTQI and the oil and gas companies is very important in terms of the development of knowledge and the skills of the technicians in order to support the strategy of the LNEO.* (Manager in an oil and gas company)

Table 5.18 shows the responses of the managers towards the knowledge of the PTQI's students, graduates and trainees in conducting and managing the work effectively. The majority (5 or 62.5% to 7 or 87.5%) of the managers agreed on all the issues concerning the management and competence of the students and technicians in terms of the different perspectives relating to decision making, working out problems, responsibilities, difficulties and engagement in work

teams. Although the majority of respondents were positive towards the 14 issues in Table 5.19, a number of the managers highlighted weaknesses as regards the efficiency of the education and training programme. These included the following:

- The trainees are not rigorous in setting objectives
- The trainees do not always accept responsibility
- The trainees have trouble dealing with difficulties

In addition, the majority (4 or 50% to 8 or 100%) of the managers also agreed with the 11 issues relating to the achievement of the objectives for both the PTQI and the oil industries (see Table 5.20). The highest responses (with 100%) in terms of agreement were on 2 issues: the TET programme is often accomplished according to the setting up of target objectives and the PTQI and oil industries decide what new technology should be envisaged in the TET programme. In fact, both of these issues are likely to contribute to the development of technicians as well as the work. In addition, the managers were also very much in agreement (87.5%) on issues relating to the response of the PTQI to the oil industries, sharing the responsibility for the required budget for the next academic year. These results are in agreement with the manager's responses to the issues in Table 5.19.

Table 5.19. Responses according to the students, graduates and trainees for conducting and managing the work effectively.

	<b>Agree(%)</b>	<b>Don't know(%)</b>	<b>Disagree(%)</b>
1- Making correct decisions	6(75)	1(13.5)	0(0.0)
2- Defining needs	5(62.5)	2(25.0)	1(13.5)
3- Setting objectives	5(62.5)	2(25.0)	1(13.5)
4- Collecting information	7(87.5)	1(13.5)	0(0.0)
5- Work alternatives	6(75.0)	1(13.5)	2(25.0)
6- Identifying alternative solutions	6(75.0)	2(25.0)	1(13.5)
7- Evaluating options	7(87.5)	1(13.5)	0(0.0)
8- Identifying problems	5(62.5)	3(38.5)	0(0.0)

9- Analysing problems	5(62.5)	2(25.0)	1(13.5)
10- Managing problems	5(62.5)	3(62.5)	0(0.0)
11- Solving problems	6(75.0)	1(13.5)	1(13.5)
12- Accepting responsibility	5(62.5)	0(0.0)	3(37.5)
13- Dealing with difficulties	5(62.5)	1(13.5)	2(25.0)
14- Engaging in team work	6(75.0)	2(25.0)	0(0.0)

Table 5.20. Managers' responses towards assessment issues relating to achieving the objectives of both the PTQI and the oil industries effectively.

	Agree (%)	Don't know (%)	Disagree (%)
Coordination and consultation between the PTQI and the oil industries prevails when organising technical education	6(75.0)	2(25.0)	0(0.0)
The PTQI's administration coordinates the activities required by the oil industries with the teaching staff	6(75.0)	2(25.0)	0(0.0)
The TET programme administration operates annually and is comprehensive	4(50.0)	3(62.5)	1(13.5)
The TET programme is often accomplished according to the setting up of the target objectives	8(100)	0(0.0)	0(0.0)
The PTQI and the managers of the oil industries often undertake effective evaluation of the academic and training programmes	6(75.0)	2(25.0)	0(0.0)
The PTQI's administrative staff are able to respond to the oil industries effectively	7(87.5)	0(0.00)	1(13.5)
Continue .....			
The PTQI's administration are aware of their tasks which require coordination with the oil industries	4(50.0)	3(62.5)	1(13.5)
The PTQI's administration takes responsibility for the annual planning and timetables of the next academic year	5(62.5)	2(25.0)	1(13.5)
The PTQI and oil industries' administration share the responsibility for the required budget of the next academic year	7(87.5)	1(13.5)	0(0.0)
The PTQI and the oil industries coordinate effectively on different issues related to the TET programme	7(87.5)	0(0.0)	1(13.5)
The PTQI and the oil industries decide the new technology that should be envisaged in the TET programme.	8(100)	0(0.0)	0(0.0)

### 5.4.3- Summary

This section focused on an analysis of the qualitative data which was collected from the structured interview. Two main issues relating to manager perceptions were addressed to embark on the effectiveness of the TET programme and the coordination between the PTQI and the oil industries in developing competent technicians was analysed according to frequency, percentage, mean and the chi square. The results indicate that the majority of the respondents agreed with majority issues posted to the teaching staff, students and technicians working in the oil industries. In addition, managers at PTQI and the oil industries were most likely to agree on issues of the structured interview.

The next chapter will deal with the general discussion and conclusion.

## **Chapter Six**

### **Discussion and Results**

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#### **6.1- Introduction**

The previous chapters focused on the background of this research, the methodology and the results relating to the assessment of the Technical Educational and Training (TET) programme in Libyan. This programme is delivered by the Petroleum Training and Qualifying Institute (PTQI) in collaboration with the oil industries and concerns a number of issues, including planning and strategy. Therefore, this chapter concentrates on the triangulation of information for the three main elements, namely the background, methodology, and analysis of the results obtained from both the questionnaires and the structured interviews. It also includes a discussion of the results obtained in the previous chapter, with the aim of answering the last research question for this study: *What conclusions can be drawn from this study?*

As indicated in Chapter 2, the oil and gas industries in Libya are major sectors that contribute significantly to the economy in Libya. Indeed, the development of human resources, and particularly technicians, is essential to sustain the oil and gas industries; this also preserves and develops other sectors, such as education and health. Therefore, this research is important in terms of it being the first of its kind to be conducted. It will further contribute to an understanding of the nature of the educational and training processes as well as adding to knowledge concerning technical education and human resources development. The literature clearly indicates that education and training have become major motivating forces for developmental acceleration (MOET, 2001). Additionally, education and training are considered to be determining factors for the success or failure of national companies against international competitors and for the success and well-being of individuals.

The overall information in the previous chapters answers the specific research questions and hypotheses (Chapter 1). The purpose of this chapter is therefore to provide a general summary for the previous chapters, synthesising the findings in relation to the proposed hypotheses before exploring the conclusion. Therefore, unless otherwise indicated and crucial for comprehension, this chapter will not repeat any part of the previous chapters. However, for convenience and to present a coherent account in the discussion, the research objectives and hypotheses will be partially repeated here:

As set out in Chapter 1, the study seeks to achieve the following the objectives:

- 1- To provide a general perspective on the role of the PTQI in developing a skilled workforce for the oil industries.
- 2- To explore the perceptions of the respondents (teaching staff, students and technicians in the oil industries) on how they perceive the quality of education in developing an effective workforce for the oil industry.
- 3- To examine the effectiveness of the curricula in supporting the acquisition of knowledge and skills necessary for the oil industry.
- 4- To assess the quality of the teaching and learning process to see how much they contribute in supporting the students' progress.
- 5- To assess the quality of the educational resources and to establish how efficient they are in supporting education and training.
- 6- To identify the strengths and weaknesses of the planning and assessment policy in the PTQI.

The structure of this chapter includes the following sections:

- Summation and reflection
- General discussion
- An overview of the data analysis and justification of the hypotheses
- Conclusion and recommendations

## **6.2- Summation and Reflection**

This thesis is composed of 6 chapters concerning the assessment of the TET Programme as provided by the PTQI. As indicated in the introduction, and for the purposes of achieving an adequate understanding of the research problem, three elements of information should be analysed and discussed. These are: the background to the research problem, the reliability of the methodology and an analysis of the research findings. Therefore, the following sections will focus on providing a roundup of the information in the previous 5 chapters. These will then clarify the reality of the Technical Education and Training in the preparation of technicians for the oil industries in Libya.

### **6.2.1- Textual Issues**

In order to set up the research project, it was necessary to acquire information with which to formulate the research problem, the aim, objectives and the research questions. Therefore, Chapter 1 included the details of these issues and reflected on the researcher's interest, considering the reasons why the project was selected for investigation. The chapter also described the significance of the project, since the gas and oil sector is considered a vital sector for the development and modernisation of the country. The details of the research problem were therefore set out, including its rationale and hypotheses, which will be justified later in the conclusion section. Hence, Chapter 1 evolved as an introductory chapter to provide the necessary background and context for the research project.

An understanding of the research problem was therefore necessary in order to support the context of the research project. Additionally, a critical analysis of the literature would contribute by providing a framework for the research project and specifying the research aim, objectives and questions that needed to be addressed. The background related to the importance of the development of technicians for the Libyan oil industries, as well as clarifying and highlighting various undisclosed issues, in particular, the fact that no study had been

conducted previously in this field. This indicated that this project would contribute new knowledge about the nature of the relationship between the PTQI, as a provider of technicians, and the gas and oil industries, as users of technicians.

Since gas and oil have strongly influenced the country's economic perspectives, they are essential elements for the development of the socio-economic prospects of the country. Hence, it was necessary to acquire information that could underline the issues concerning the significance of the PTQI for the gas and oil industries. Consequently, the general aim of the technical educational and training programme provided by the PTQI is to contribute to the progress of the economy by improving the skills of Libyans in a number of technical education fields for the gas and oil industries.

In addition, further information was provided to support the background of this research project, including technical education and training and the significance of the development of human resources. Thus, the purpose of Chapter 3 was to address the distinctions between education, training, and human resources' development (HRD). In addition, it was necessary to highlight particular issues concerning the development of human resources in developing countries. Although, oil producing countries have different perspectives compared to other developing countries, the development of human resources involves education and training and both of these elements are essential to promote knowledge and skills.

Generally, the first three chapters constituted an introduction and supporting background for this research problem. This information was then used to formulate the rationale of the research project and through the acquisition of details provided an understanding of specific issues in relation to the research problem. In addition, the literature contributed to an understanding of what was required to collect the necessary data in relation to the TET programme and issues that would clarify the PTQI and its relations with the oil industries in developing competent technicians. Therefore, Chapter 4 dealt with the



methodology adopted in this research project; this mainly included the design and development of the methods used to collect the data. Two main approaches, namely those of quantitative and qualitative analysis, were used to do this via a questionnaires and structured interviews'. Both approaches are commonly used and are well documented in the literature (Bryman, 1995; Blaxter et al., 2006; Gall et al., 1996; Neuman, 2000).

### **6.2.2- Methodological Issues**

In order to establish how to plan and tackle the research problem, it was necessary to adopt particular methodological approaches. In this way, the necessary data required to provide the answers to the research questions was collected. Various activities were employed for specifying the type and the method of data collection. Therefore, use of the literature (Bryman, 1995; Blaxter et al., 2006; Gall et al., 1996; Neuman, 2000) was necessary in order to decide which methodologies were most suitable for collecting reliable information to complete the study. This then led to the researcher's decision to adopt the aforementioned quantitative and the qualitative approach. The reason for choosing both approaches was to overcome the weaknesses inherent in each individual approach (see Chapter 4). In general, many studies have used a variety of methods, including mainly employing questionnaires and interviews (Blaxter et al., 2006; Gall et al., 1996). Additionally, some of the literature has recommended using different approaches depending on the nature of the research problem under examination (Bell, 1999; Neuman, 2000; Gratton and Jones, 2004; Blaxter et al., 2006)

In this research, 3 questionnaires and 2 structured interviews were designed and formulated to collect the necessary data according to the aim and objectives of the study. The three questionnaires had the same concepts but different wording, this being compatible with the perceptions of each of the sample populations. The quantitative data was therefore collected from 3 population samples: teaching staff (26 or 74%), students (111 or 46%) and former graduates of the

institute (210 or 63%) who are now working in the oil industries. The statistical analysis clearly indicated that the overall reliability test for the three questionnaires was more than  $\alpha = 0.9$ , so indicating high reliability. The alpha values for the 5 main areas (i.e. the quality of the TET programme, the curricula, the teaching and learning, the educational resources as well as the educational planning and assessment) ranged between 0.70 and 0.86. In addition, the qualitative data was collected using two structured interviews with managers in the PTQI (5 or 45.5%) and the oil industries (3 or 60%). Both interviews had the same concept but different wording.

### **6.2.3- Overall Findings**

The literature and textual analyses, alongside the methodology have identified various significant issues which provide an indication of the perceptions of the respondents. The quantitative approach was largely based on the 5 sets of facets or areas, each containing 12 issues with a three-point scale of agreement, not knowing or disagreement ('Agree', 'Don't know' or 'Disagree'). The questionnaires were addressed individually to 3 sample populations, namely teaching staff, students and technicians. The data collected on the 5 main topics were represented by the dependent variables and showed how the different respondents perceived the issues relating to the quality of the TET programme, the curricula, the teaching and learning, the educational resources, as well as the educational planning and assessment. In addition, the questionnaires characterised the independent or demographic characteristics of the respondents.

Findings for the independent variables illustrated the demographic characteristics of the 347 respondents, these being distributed as follows: 26 teaching staff, 111 students and 210 technicians. Generally, the results indicate that all the respondents were males and most of the teaching staff belonged to the age group of 'more than 45 years', held a BSc degree and had between 6-10 years' of experience. The majority of the students belonged to the 18-24 years (99.1%)

age group and applied to study at the PTQI of their own free will (78.4%). In addition, the majority of the technicians belonged to the 18-24 and 25-30 years (58.1%) age groups and had experience of 1-5, 6-10 and 11-15 years (76.3%). Most of the students and technicians were specialised in instrumentation. Generally, the findings from the dependent variables indicated that the majority of the respondents from the 3 sample populations agreed on the issues of the 5 main topics. However, up to 34% of the respondents disagreed with 60 issues asked of each group. For the sake of simplicity, only the responses above 10% were considered for analysis in Chapter 5. Table 6.1 summarises the responses that disagree with issues from the 5 main topics.

Table 6.1. Summary of responses with the 'Disagree' option

Facet <sup>1</sup>		Teaching Staff	Students	Technicians
Quality of the TET programme	Responses (%)	11.5-15.4	13.5-15.2	11.9
	No. of Issue with the highest % <sup>2</sup>	11, 12	11, 12	12
Curricula	Responses (%)	11.5	10.8-21.6	18.6
	No. of Issue with the highest % <sup>2</sup>	12	1-5, 7, 9-12	12
Teaching and learning	Responses (%)	11.5-23.1	10.8-24.3	13.8-16.2
	No. of Issue with the highest % <sup>2</sup>	1,2,10	1,2,4,5, 8-11	1, 2
Educational resources	Responses (%)	11.5-38.5	10.8-30.6	13.8-20.0
	No. of Issue with the highest % <sup>2</sup>	1-8, 12	1-7, 9-12	1-7, 12
Educational planning and assessment	Responses (%)	none	10.8-27.9	12.4-31.9
	No. of Issue with the highest % <sup>2</sup>	none	3-7, 9-12	6,7,11

<sup>1</sup> each facet includes 12 issues, <sup>2</sup> the number of the issue refers to the same number in each of the 5 facet in the questionnaires.

A summary of the finding indicated that the 3 groups of respondents mainly disagreed on 2 issues relating to the quality of the technical education and the training programme. The first issue concerned the employment of the PTQI

graduates in the oil industries with 11.5% to 13.5% of respondents disagreeing, while 11.5% to 15.4% disagreed with the conducting of research by the PTQI to improve the performance in the oil industry or to solve problems. Responses to curriculum issues indicated that the students disagreed more with issues (10 topics on which they disagreed (%) = 10.8 - 21.6) (Table 5.8) relating to the curricula compared to the teaching staff (1 issue of disagreement = 11.5%) (Table 5.3) and the technicians (1 issue of disagreement = 18.6%) (Table 5.13).

The results also indicate that respondents disagreed on various issues relating to educational resources. The teaching staff (11.5% and 38.5%) disagreed with 9 topics (75%) (see Table 5.5, Chapter 5) regarding the availability of books and journals. Similar response rates were given by the students (10.8%-30.6%) and the technicians (13.8% - 20.0%) for the same issues (see Tables 5.10, 5.15).

The respondents also disagreed on areas concerning teaching and learning (Tables 5.4, 5.9, 5.14), including the updating of teaching materials and the equipment and technology, the teaching strategy, student support and the teaching outcomes. The responses of the teaching staff towards these issues were between 11.4% and 23.1%. The students and technicians showed similar disagreement towards teaching and learning issues, these ranging between 10.8% - 24.5% and 13.8% - 16.2% respectively (Table 6.1).

### **6.3- General Discussion**

Clearly, science and technology are crucial aspects of modern day life and therefore technical education and training are an essential backbone of a whole variety of disciplines, including computer science, engineering and industry. Consequently, it is very important that the oil and gas industry should have training in order to produce and develop a competent workforce. This is because these industries are moving rapidly due to high demand and high revenues. As already observed, this sector is vital for Libya and makes a huge contribution to sustaining the country's economy: gas and oil revenue is approximately equal to 95% of the country export. Therefore, for Libya to progress, it is necessary to

improve the oil and gas industry, developing a highly qualified workforce, and thereby developing the country's economy. As a part of the workforce, technicians are required for the sustainability of the oil and gas industries. The production and development of technicians has been conducted by the PTQI through the TET programme since the establishment of the institute in August 1970. It is therefore surprising that in the 40 years since the TET programme started, no study has been conducted to assess this programme. Consequently, this study constitutes an important step not only in terms of education and training but also in the attitudes of the oil and gas officials to developing the performance of the industries. Therefore, the study can also contribute to the body of knowledge in this area of study as well.

Generally, education and training are essential to raise the profile of the oil and gas industries. It is most likely that raising the standard of industries can be done through retraining and developing the workforce. An indeed training and retraining person is more effective for the oil industries than employ new people. Two factors govern the benefit of staff retraining; the difficulty of retaining the new staff in the long term and fast modernisation of the instruments and tools for the oil industries.

In addition, the educational and training process is influenced by the quality and availability of resources and their management. These elements are interrelated and can impact on the effectiveness of the preparation and development of technicians for the oil industries (Figure 6.1).

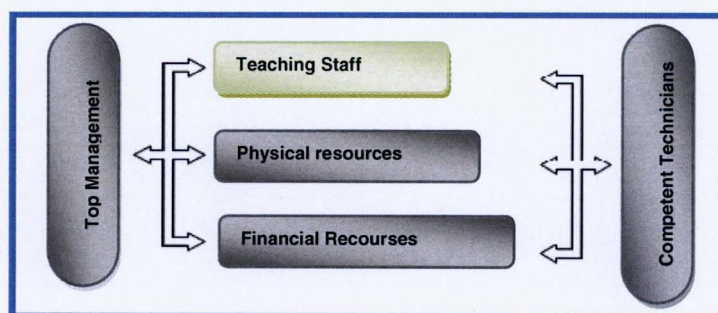


Figure 6.1. The interrelated elements in the development of competent technicians.

Source: the researcher

The quality of management and teaching staff and the availability of the physical resources are vital elements that contribute to the development of competent technicians. In this respect, observation during the field study at the PTQI indicated that the building is purpose built for teaching and training technicians to work in the oil industries. The laboratories were well established, as indicated by the set up and amount of equipment in the PTQI laboratories. In addition, the lecture rooms were furnished with comfortable chairs and a Smart board and Data Show could be seen in the lecture rooms. This indicates that resources for teaching can positively influence an effective teaching and training process; they can also partially contribute to the outcomes of the academic process.

Furthermore, the resulting competent technicians will contribute to the effectiveness and sustainability of the oil industries. Therefore, in order to assess the TET programme, it was necessary to investigate the perceptions of the main stakeholders, including the teaching staff, students and graduates working in the oil industries. In this respect, the quality of the TET programme can be seen from the various viewpoints relating to the PTQI, namely as property and having educational effectiveness, being popular with students and coordinating with the oil industries. The results indicate that the three sample populations were in agreement as regards the quality of the TET programme for the majority of the teaching staff, students and technicians. These respondents also believed that the PTQI satisfies the purpose of the TET programme. In this way, the PTQI produces technicians to work with the oil and gas industries according to certain arrangement with the oil industries. This is a step forward not only in terms of building up the local workforce for the oil and gas industries, but also in serving the modernisation programme. In this regard, technical education has become a worldwide preferences and as a vital step for modernisation. In addition, vocational education is also an important movement to catch up with the developed countries where vocational education constitutes building up the skills required for rapid economic development. It is also generally accepted that industry's partnerships with a technical education provider contribute to a work-

based education and training quality. The majority of the respondents were satisfied with the issues relating to the quality of the TET programme, but approximately 11% of them disagreed with topics relating to the employment of graduates in the oil and gas industries, as well as the PTQI conducting research to improve performance. Although not all graduates are employed at the oil and gas industries, they still work in their respective fields, and many either complete their studies home or abroad or are employed at the PTQI as technicians. Therefore, in this respect the skills and experience gained by graduates have not gone to waste.

The educational process at the PTQI involves various elements, including the curricula, teaching and learning, educational resources and how the planning and assessment of the educational process is conducted; these issues represent the backbone of the technical education. Hence, the curriculum also involves technical and general activities. The purpose of the curriculum includes the enquiry of both knowledge and skills by students, as required for the oil and gas industries. The findings clearly indicate that the majority of respondents positively perceived the issues relating to the curricula as provided by the PTQI.

The main element of the education process is the clarity of the aim and objectives of the curriculum. Curriculum in technical education includes both technical and general activities, which should be directly related to the workplace. Here, most of the teaching staff, as well as the students and technicians, agreed on these issues. These findings may also reflect the effectiveness of the technical education and training programme. The responses to, however, also demonstrated that the curricula does not keep abreast of technological advancements in the oil industries. The students' responses also disagreed with another 9 issues relating to: the curriculum aim and objectives; the curriculum's relation to the oil and gas industries; the provision of quality and the transportability of skills; the capability of the students to develop problem-solving skills; the development of an educational background; the provision for understanding a career in the oil and gas industry; the competitiveness of the

curriculum with the curricula of other countries; the development of coordination skills. Although most of the respondents agreed about issues relating to the curriculum, further study is necessary to investigate the effectiveness of its framework. The PTQI curriculum can therefore assist students in the preparation of their career.

Generally, the way in which teaching and learning achievement can be assessed is associated with the scope, nature, format and characteristics of the curricula adopted to deliver the TET programme by the PTQI. The literature indicates that assessment of the curricula can be accomplished by measuring the content. The results obtained from the technicians who had graduated from the PTQI and are now working in the oil and gas industries, support the effectiveness of the curricula delivered by the PTQI. As previously demonstrated, these technicians were satisfied with particular topics, the extent of their agreement ranging between 57.6% and 86.7%.

Teaching and learning is another essential element in the technical education process. These are closely associated with the nature and format of the curricula used and how they relate to work in particular fields in the oil and gas industries. Therefore, teaching and learning should include a bridging context and activities. In this way, the Technical Education and Training programme should be based on the acquisition of knowledge, skills and attitudes to emphasise the occupational contexts.

Generally, teaching can be influenced by the quality of lecturer, the student's entry level and their attitude to learning as well as technology. The triangulation of these three elements is also interrelated with other factors, including a purposely designed curriculum and other related factors, as illustrated in Figure 6.2. These include the lecturer's competence, the students' interest, the availability of resources and the institutional conditions. Of these, the lecturer's competence and clear aims and objectives are the most likely to contribute to the effectiveness of the technical education process. As indicated above, technical education involves concepts and activities, and therefore it is essential to



modernise technology in order to support the activities for acquiring skills in different areas of the oil and gas industries. The findings in the previous chapter indicate that half the respondents agreed with issues related to teaching and learning at the PTQI. However, the rate of responses (48%-88.5%) did not seem high in comparison to the other issues relating to the quality of the TET programme, the curricula, the teaching and learning, the resources and planning and the assessment of the educational process. However, at least 11.5% of the respondents from the three categories disagreed with the two issues relating to the updating of the teaching materials with new knowledge and the workshops being equipped with new technology.

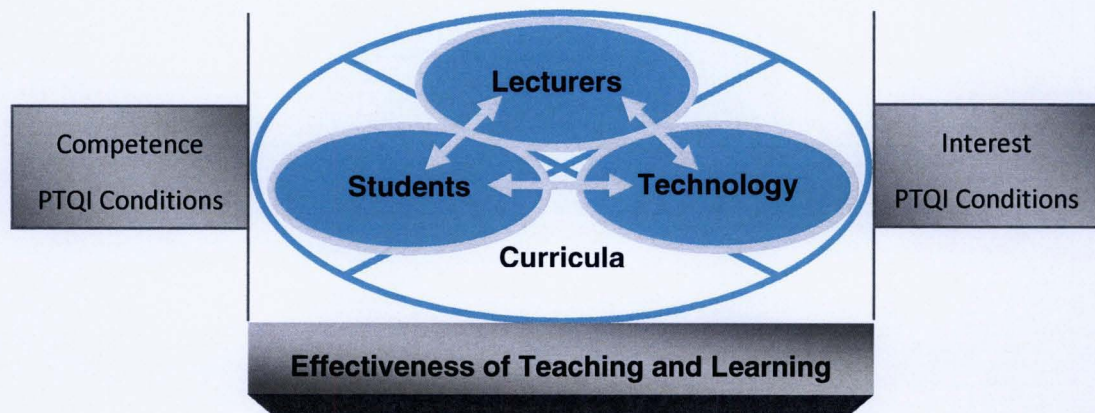


Figure 6.2. Schematic diagram for the triangulation of the main factors that influence teaching and the learning process.

As indicated above, that teaching and learning process contribute to the occupational contexts and the competence of technicians. Therefore, the educational and training programme requires educational resources for the development of the technicians' competence. Indeed educational resources, including machines and equipment, help the students and trainees to build their comprehension, knowledge and practice activities required for their work in the industry. In addition, educational resources are also interrelated with the curricula, and the effective operation of machines and equipment helps sustain

the oil and gas industries. Likewise, planning and assessment of the educational and training process are likely to contribute to the effectiveness of the TET programme, with the aim of producing competent technicians for the industries. Results in this thesis, however, indicated that although the majority of respondents were positive towards issues relating to the 5 main topics, between 11.5% and 38.5% gave negative responses.

#### **6.4- An overview of the data analysis and the justification for the hypotheses**

In order to verify the 7 hypotheses listed in Chapter 1, several analyses were made in the previous chapter. These analyses addressed the research questions and verified the following 7 proposed hypotheses:

*Respondents consider that there is no collaboration in setting up the strategies and policies of the institute with respect to the curricula development, educational visits to the oil industries, the number of enrolled students and the employment of the graduates.*

*Respondents of the TET programme, provider (teaching staff) and the TET programme users (oil industries) do not think they are adopting partnership strategies and policies with the aim of increasing the effectiveness and efficiency of the TET programme.*

*Respondents do not think the PTQI offers quality education and training in conducting the TET programme.*

*Respondents do not consider that the PTQI provides and delivers curricula that enable students to acquire knowledge and skills that the oil industries need for their development.*

*Respondents think that teaching and learning do not take place effectively and students do not realise their potential and enhance their effectiveness when they take up their jobs in the oil industries.*

*Respondents do not think that the institute is well equipped with resources that support the development of the key competencies of the work force for the oil industries in Libya.*

*Respondents do not think that the institute has adapted educational planning and assessments to improve teaching and learning standards.*

These hypotheses were verified based on the general data analysis and chi square analysis. It is clear from the findings in Chapter 5 that the overall perceptions of the respondents showed satisfaction over issues related to the assessment of the TET programme provided by the PTQI. The first approach to substantiate the hypotheses depends on the overall discussion and evidence evolved from the results in Chapter 5, as well as other chapters in this thesis. Chi square can also be used to substantiate a hypothesis based on the null hypothesis. Generally, the null hypothesis is either accepted or rejected, depending on the level of the significant differences between the tested variables. Generally, if there is a significant difference between variables, or the probability 'p' is less than 0.05, the hypothesis is rejected. However, if the variables show no significant differences then the null hypothesis is most likely to be accepted. Accordingly, in view of the obtained results, the first hypothesis is most likely to be accepted, as the majority of the respondents agreed on the collaboration/coordination between the PTQI and the oil and gas industries, that is to say, the providers and users of the TET programme. In addition, chi square analysis indicated that issues relating to collaboration/coordination showed no significant differences, and hence the null hypothesis was rejected. This also appears to indicate that the overall analysis of the quantitative and qualitative data was most likely to indicate the acceptance of the other 6 hypotheses. Therefore, once again and in addition to the satisfaction of the majority of respondents with the relevant issues, the null hypotheses were most likely to be rejected.

## **Chapter Seven**

### **Conclusion and Future Work**

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#### **7.1- What conclusions can be derived from this study?**

The overall data analysis and discussion in the previous chapter have increased insights into the impact of the TET programme, the effectiveness of the PTQI and the importance of the oil and gas industries to the economy. The results have largely described a synthesis of knowledge as set out in all the chapters. As indicated in the various parts of this thesis, oil and gas are considered the main revenue to sustain the economy of the country. Therefore, the oil and gas industries not only provide the dynamic resources and the prospects of economic development, but also contribute to the modernisation of education, health and the country as a whole. There is therefore no doubt that the technicians can contribute to sustain the oil and gas industries. Indeed, the development of competent technicians and their training is the right step forward for the development of the oil and gas sector in Libya. Here, research is essential to analyse the performance of the educational organisations. The significance of this research is therefore related to the fact that it has been conducted for the first time to my knowledge, so contributing to the management of the TET programme and the improvements of the PTQI's effectiveness. The main problem is that this study includes an investigation of five main issues, including the quality of the TET programme, the curricula, the teaching and learning as well as educational resources, educational planning and assessment. In addition, it investigated other problems related to the strategy of the TET programme, the partnership between the provider and the user of this programme in addition to the development of competent technicians.

Since the aim of this study is to assess the TET programme, the researcher hopes that this project will contribute to an understanding of the TET programme, and prompt further research in this area to assess individual departments at PTQI and its coordination with the oil industries. The findings here have therefore highlighted a number of positive points that may contribute to the development of the oil industry in Libya:

1. As oil and gas are vital resources for Libya, this research will contribute, alongside other international studies, as essential information for filling the gap in knowledge.
2. There is need for the continuous training of the technicians.
3. The graduates are automatically offered employment at the oil companies, indicating a good investment in the human resources.
4. The students and teaching staff are likely to be attached to the PTQI.
5. The technicians value the PTQI.
6. The teaching staff at the PTQI and the oil companies are likely to cooperate with regard to the development and production of technicians.
7. The TET programme is consistently delivered by the PTQI.

Nonetheless, the respondents who selected the 'Disagree' option for the 41 (68.3%) issues have highlighted some of the problems, which require further research in order to complement this project. The new research should include a greater sample population and cover all the departments at the PTQI. Such new research should ideally include all the oil and gas industries in Libya. Therefore, it is anticipated that the findings here, despite their positive outcomes, will come to be seen as a major step towards a future where improvements in the efficiency of delivering the TET programme are encouraged.

## **7.2- Future work**

This study evaluated the TET programme in Libya and the results provide a positive picture of the efficiency of the TET programme in producing competent

technicians for the Libyan oil industry. However, although the previous sections provide and discuss the results, they do not necessarily indicate that research in this field is final. In fact, further study is needed to evaluate the delivery of the TET programme and the efficiency of the PTQI in carrying this out.

The reason for further study required is due to the limitations encountered in this research. Uppermost amongst these limitations was the shortage of time for collecting data, particularly qualitative data. It is important to note that most of the oil industries are located far away from the PTQI and my home city; therefore, more time was needed for travelling as well as for staying at locations near the oil industries.

Some recommendations for further work are summarised below.

(1) To collect more quantitative data, mainly from the teaching staff, who responded less to the questionnaire despite repeated requests and in contrast to the students.

(2) To use the same questionnaires and interviews techniques as those used in this study. The use of the same techniques would therefore validate and rationalise this data and demonstrate if the majority of respondents continue to agree with the issue in the five areas of the questionnaire.

(3) To separate the sample populations (the teaching staff, students and technicians who have graduated from the PTQI) and analyse their perceptions according to their respective fields of study. Hence, it is recommended that the questionnaires should be distributed separately to the teaching staff, students and technicians in each of the 11 fields. Such data is therefore likely to highlight if there are particular problems for the TET programme in any of the departments.

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## Appendix 1 The Questionnaire

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### Questionnaire One addressed to teaching staff at PTQI

#### Introduction

Dear Lecturer

The aim of this research is to assess the ability of the Technical Education and Training Programme in providing skilled technicians for the National Oil Industry.

Your assistance in completing this questionnaire will enable vital information to be revealed about the role of the institute in providing the necessary skilled workforce to improve and develop the oil industries in Libya.

Your answers will be treated in complete confidence and will only be used for research purposes. You may therefore wish to add your name and/or department/section at the end.

Thank you for your cooperation.

#### Ibtihal Yuseif

PhD student,

Edinburgh Napier University, Scotland,

UK

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### 1- Independent Variables

Please select on option from the following categories

#### 1.1- Occupation

Lecturer  Assistant Lecturer   
Technician

#### 1.2- Gender

Male   
Female

#### 1.3- Qualification

BSc.  Science  Engineering   
MSc.  Science  Engineering   
PhD.  Science  Engineering

**1.4- Age**

- |                    |                          |                   |                          |
|--------------------|--------------------------|-------------------|--------------------------|
| Less than 25 years | <input type="checkbox"/> | 26-30 years       | <input type="checkbox"/> |
| 31-35 years        | <input type="checkbox"/> | 36-40 years       | <input type="checkbox"/> |
| 41-45 years        | <input type="checkbox"/> | 46 years -or more | <input type="checkbox"/> |

**1.5- Work experience in your current occupation**

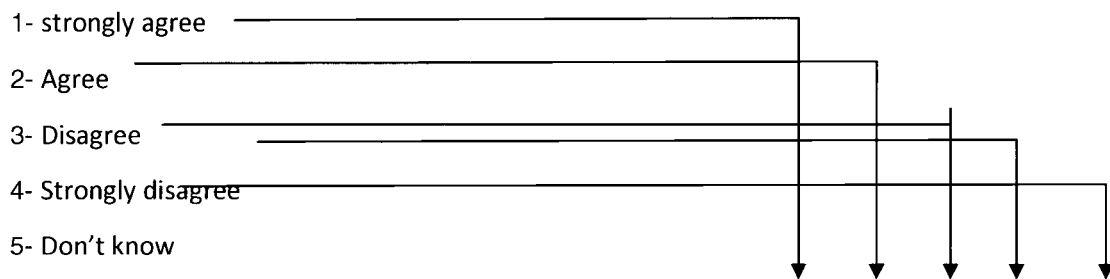
- |             |                          |                  |                          |
|-------------|--------------------------|------------------|--------------------------|
| 1-5 years   | <input type="checkbox"/> | 6-10 years       | <input type="checkbox"/> |
| 11-15 years | <input type="checkbox"/> | 16-20 years      | <input type="checkbox"/> |
| 21-30 years | <input type="checkbox"/> | 31 years or more | <input type="checkbox"/> |

**1,6- Previous working experience**

- Oil Industry
- Chemical Engineering
- Other  please specify .....

**2- Dependent Variables**

This part of the questionnaire includes 5 sections. In each section you have five options: Please select only one option for every statement in each section, as in the following example:



		1	2	3	4	5
1	The training institute contributes to the supply of a highly qualified workforce for the oil industry	√				
2	The training institute responds to the oil industries demands for sufficiently skilled graduates		√			

3	The training institute is a very demanding course.	√
4	The training institute provides competent and skilled graduates that benefit the oil industry.	√

## 2.1- The quality of technical education and training programme (TETP)

The following statements are related to quality of TET programme given by PTQI.

To what extent do you agree or disagree with the following statement?

		Agree	don't know	disagree
1	The PTQI contributes to the supply of a highly qualified workforce for the oil industry			
2	The PTQI responds to the oil industries' demands for adequately skilled graduates			
3	Studying at the PTQI is popular with secondary school graduates.			
4	The PTQI provides competent and skilled graduates who benefit the oil industry.			
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry			
6	The PTQI meets the demands of the oil industry for technicians.			
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.			
8	The PTQI ensures that quality of the teaching and training are in accordance with the recruitment policies of the oil industry.			
9	The PTQI is keen on developing teaching and training in partnership with the oil industry.			
10	The PTQI coordinates with the oil industries on the quality assurance of the TET programme .			
11	All the graduates trained at the PTQI can be employed by the oil industry.			
12	The PTQI often conducts research to improve the performance of the oil industry or to solve problems.			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.2- Curricula

The following statements are related to curricula adopted for the TVETI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The curriculum has clear aims and objectives			
2	The curriculum is directly related to graduate needs in practice.			
3	The curriculum offers graduates the quality of skills required by the oil enterprises			
4	The curriculum offers graduates skills that are required by and compatible with the oil enterprises.			
5	The curriculum enables graduates to develop problem-solving skills effectively.			
6	The curriculum enables graduates to develop decision-making skills effectively.			
7	The curriculum provides a good educational background for students to progress in their respective fields.			
8	The curriculum provides adequate training prospects for students to enhance their effective educational learning			
9	The curriculum provides the students with adequate opportunities to develop an understanding of how their education will assist them in their careers in the oil industry			
10	The Libyan curriculum is highly competitive with the curricula of other countries			
11	The curriculum provides students with effective coordination skills			
12	The curriculum keeps abreast of technological advances in the oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

### 2.3- Teaching and learning

The following statements are related to teaching and learning in PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The teaching materials are consistently updated in accordance with new emerging knowledge.			
2	Workshops and practical sessions are often equipped with new technology			
3	The teaching and learning process is appropriately assessed for every level			
4	The teaching strategy provides a good basis for predicting how the students will progress in their learning			
5	The teaching and learning programme provides opportunities for the students to develop their capabilities as successful learners.			
6	The teaching and learning programme provides opportunities for the students to develop their capabilities as confident individuals			
7	The teaching and learning programme provides opportunities for the students to develop their capabilities as effective contributors in dealing with challenges.			
8	Teaching outcomes are assessed and evaluated annually			
9	Students receive good support and help from the lecturers			
10	The majority of the students are enthusiastic and interested in the field.			
11	The teaching programme has a good balance of theory and practice			
12	The teaching programme includes regular field trips to the oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.4- Educational resources

The following statements are related to educational resources in PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The library has good access to electronic journals relating to work in the oil industry.			
2	The library is a good source of books and documents relating to work in the oil industry.			
3	Lecturers often use journals and books as resources to update their teaching materials.			
4	Lecturers often use journals and books as resources for research only.			
5	Lecturers often encourage students to use journals and books in the library.			
6	There are adequate copies of the books in the library for use by the students			
7	Lecturers often recommend new books for the library to purchase.			
8	The PTQI is completely independent in terms of resources used in the practical or workshop sessions.			
9	All the resources required for practical or workshop sessions are located in the training institute's buildings.			
10	Lecturers value the academic achievements of the training institute			
11	Lecturers take pride in this institute			
12	Lecture and practical rooms are suitably equipped with information communication technology of a good standard			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				



## 2.5- Educational Planning and assessment

The following statements are related to planning and assessment.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The PTQI uses annual assessment as a method for evaluating teaching and learning progress.			
2	The PTQI has adequate plans to improve the effectiveness of the training.			
3	The PTQI is flexible in adopting new teaching techniques			
4	The PTQI regularly reflects on development to set clear goals and targets			
5	The PTQI regularly achieves set goals and targets			
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry			
7	Assessments within the PTQI correlate well with a career in the oil industry			
8	In the planning process, the PTQI regularly works with the oil industries			
9	Additional planning time would allow the PTQI students to use assessment methods more effectively			
10	In its educational planning the PTQI is good at adopting techniques from foreign institutes			
11	Students are adequately consulted for improving the course design			
12	The PTQI is regularly assessed and inspected by the government to improve its educational planning and efficiency			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## Questionnaire Two: addressed to the final year students at the PTQI

### Introduction

Dear Student

The aim of this research is to assess the Technical Education and Training Programme in providing skilled technicians for the National Oil Industry.

Your assistance in answering the questions of this questionnaire will enable vital information to be revealed about the role of the institute in providing the skilled workforce required to improve and develop the oil industries in Libya.

Your answers will be treated in strict confidence and will only be used for research purposes. You may therefore wish to add your name and/or department/section at the end.

Thank you for your cooperation.

### Ibtihal Yuseif

PhD student,

Edinburgh Napier University, Scotland,

UK

### 1- Independent Variables

Please select on option from the following categories

#### 1.6- Gender

Male

Female

#### 1.7- Field of Study

Drilling  Welding  Mechanical

Refining  Safety and Fire  Electrical Power

Instrumentation  production  Air conditioning

**1.8- Age**

18-24 years

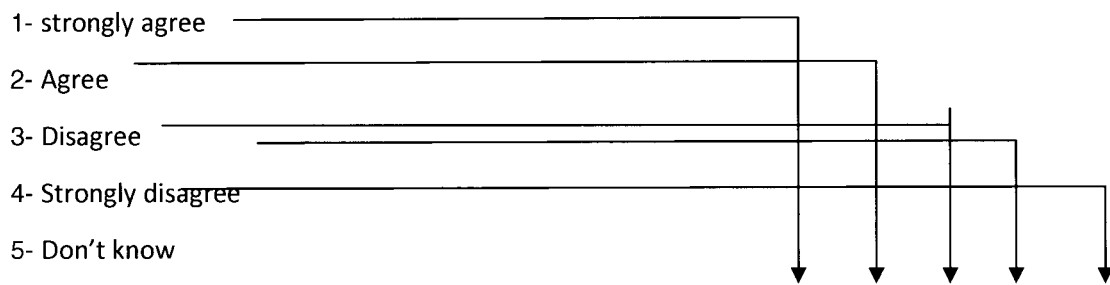
25-30 years

31-35 years

36-40 years

**2- Dependent Variables**

This part of the questionnaire includes 5 sections. In each section you have five options: Please select only one option for every statement in each section, as in the following example:



	1	2	3	4	5
1 The training institute contributes to the supply of a highly qualified workforce for the oil industry	√				
2 The training institute responds to the oil industries demands for sufficiently skilled graduates		√			
3 The training institute is a very demanding course.				√	
4 The training institute provides competent and skilled graduates that benefit the oil industry.				√	

## 2.1- The quality of technical education and training programme (TETP)

The following statements are related to quality of TET programme given by PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The PTQI is appropriately designed to work competently with the oil industry			
2	After graduating from the PTQI it will be easy to gain employment in the oil industry			
3	The PTQI course is very demanding			
4	The PTQI provides competent and skilled graduates ready for work in the oil industry			
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry			
6	The PTQI meets the demand/supply ratio balance of the oil industry.			
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.			
8	The PTQI ensures that the quality of the teaching and training are in accordance with the recruitment policy of the oil industry.			
9	The PTQI undertakes the development of teaching and activities in accordance with the institution's policy.			
10	The PTQI has good coordination with the oil industries.			
11	All graduates trained at the PTQI can be employed by the oil industry			
12	The PTQI often conducts research to improve performance in the oil industry or to solve problems.			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.2- Curricula

The following statements are related to curricula adopted for the TVETI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The curriculum has clear aims and objectives			
2	The curriculum correlates directly with the requirements of employment in the oil industry after graduation.			
3	The curriculum offers graduates the quality of skills required by the oil enterprises			
4	The curriculum offers graduates the transportability of skills required by the oil enterprises.			
5	The curriculum enables graduates to effectively develop problem-solving skills			
6	The curriculum enables graduates to effectively develop decision-making skills			
7	The curriculum facilitates the development of an educational background that can be applied to different fields			
8	The curriculum provides adequate training prospects to enhance effective educational learning			
9	The curriculum provides an understanding of a career in the oil industry			
10	The Libyan curriculum is highly competitive with the curricula of other countries			
11	The curriculum facilitates the development of coordination skills.			
12	The curriculum keeps abreast of technological advances in the oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

### 2.3- Teaching and learning

The following statements are related to teaching and learning in PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The teaching materials are consistently updated in accordance with new emerging knowledge			
2	Workshops and practical sessions are often equipped with new technology			
3	The teaching and learning processes are appropriately assessed at every level.			
4	The teaching strategy accurately reflects developments in the field			
5	The teaching programme provides opportunities for the students to develop skills as successful learners			
6	The teaching and learning programme provides opportunities to develop confidence within the field			
7	The teaching and learning program provides opportunities to develop skills in order to deal with challenges in the field.			
8	Teaching outcomes are assessed and evaluated annually			
9	The students receive good support and help from lecturers			
10	The majority of the students are enthusiastic and interested in the field.			
11	The teaching program has a good balance of theory and practice			
12	The teaching program includes regular field trips to the oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.4- Educational resources

The following statements are related to educational resources available in PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The library has good access to electronic journals relating to work in the oil industry.			
2	The library is a good source of books and documents relating to work in the oil industry.			
3	Lecturers often use journals and books as resources to update their teaching materials.			
4	Lecturers often use journals and books as resources for research only.			
5	Lecturers often encourage the students to use journals and books in the library.			
6	There are adequate copies of books in the library for use by the students			
7	Lecturers often recommend new books for the library to purchase.			
8	The PTQI is completely independent in terms of its resources for practical or workshop sessions.			
9	All the resources required for practical or workshop sessions are located in the PTQI's buildings.			
10	The lecturers value the academic achievements of the training institute.			
11	The lecturers take pride in this institute.			
12	The lecture and practice rooms are suitably equipped with information communication technology of a good standard			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.5- Educational Planning and assessment

The following statements are related to planning and assessment.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The PTQI provides feedback on assessments to improve teaching			
2	The PTQI has adequate plans to improve the effectiveness of the training			
3	The PTQI is flexible in adopting new teaching techniques			
4	The PTQI regularly reflects on developments to set clear goals and targets			
5	The PTQI regularly achieves set goals and targets			
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry			
7	Assessments within the PTQI correlate well with a future career in the oil industry			
8	Within the planning process, the PTQI is regularly involved in working with the oil industries			
9	Additional planning time would allow PTQI students to use assessment methods more effectively			
10	The PTQI is good at adopting techniques from foreign institutes in its educational planning			
11	Students are adequately consulted for improvements in the design of the course			
12	The PTQI is regularly assessed and inspected by the government to improve its educational planning and efficiency			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				



## Questionnaire Three: addressed to technicians at oil industries who have graduated from the PTQI

### Introduction

Dear Technician

The aim of this research is to assess the Technical Education and Training Programme in providing the skilled technicians for the National Oil Industry.

Your assistance in answering the questions of this questionnaire will enable vital information to be revealed about the role of the institute in providing the skilled workforce required to improve and develop the oil industries in Libya.

Your answers will be treated in strict confidence and will be used for only research purposes. You may therefore wish to add your name and/or department/section at the end.

Thank you for your cooperation.

### Ibtihal Yuseif

PhD student,

Edinburgh Napier University, Scotland,

UK

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### 1- Independent Variables

**Please select one option from the following categories**

#### 1.9- Gender

Male

Female

#### 1.10- Field of work

Drilling  Welding  Mechanical

Refining  Safety and Fire  Electrical Power

Instrumentation  production  Air conditioning

**1.11- Age**

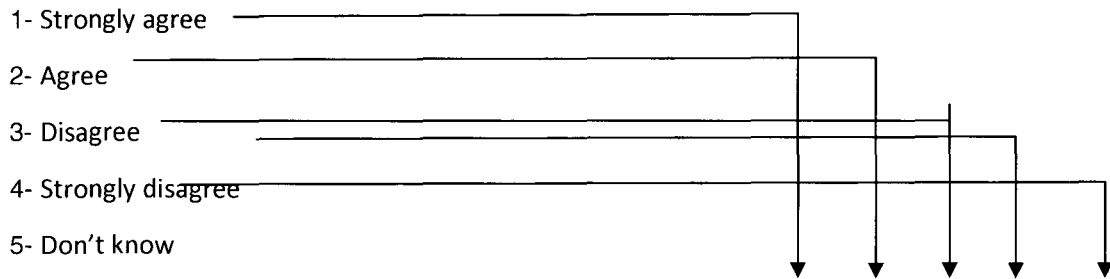
- |             |                          |             |                          |
|-------------|--------------------------|-------------|--------------------------|
| 18-24 years | <input type="checkbox"/> | 25-30 years | <input type="checkbox"/> |
| 31-35 years | <input type="checkbox"/> | 36-40 years | <input type="checkbox"/> |
| 41-50 years | <input type="checkbox"/> | 51 or more  | <input type="checkbox"/> |

**1.12- Work experience in your current occupation**

- |             |                          |                  |                          |
|-------------|--------------------------|------------------|--------------------------|
| 1-5 years   | <input type="checkbox"/> | 6-10 years       | <input type="checkbox"/> |
| 11-15 years | <input type="checkbox"/> | 16-20 years      | <input type="checkbox"/> |
| 21-30 years | <input type="checkbox"/> | 31 years or more | <input type="checkbox"/> |

**2- Dependent Variables**

This part of the questionnaire includes 5 sections. In each section you have five options: Please select only one option for every statement in each section, as in the following example:



		1	2	3	4	5
1	The training institute contributes to the supply of a highly qualified workforce for the oil industry	√				
2	The training institute responds to the oil industries demands for sufficiently skilled graduates		√			
3	The training institute is a very demanding course.				√	
4	The training institute provides competent and skilled graduates that benefit the oil industry.				√	

## 2.1- The quality of the Technical Education and the Training Programme (TETP)

The following statements relate to the quality of the TET programme provided by the PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The PTQI is appropriately designed for competence in work in the oil industry			
2	After graduating from the PTQI it is easy to gain employment in the oil industry			
3	The PTQI is a very demanding institute.			
4	The PTQI provides competent and skilled graduates ready for work in the oil industry			
5	The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry			
6	The PTQI meets a balanced demand/supply ratio for the oil industry.			
7	The PTQI provides adequate advice and scientific/technical support to the oil industries.			
8	The PTQI ensures that the quality of the teaching and training are in accordance with the recruitment policy of the oil industry.			
9	The PTQI undertakes the development of teaching and activities in accordance with the institution's policy.			
10	The PTQI has good coordination with the oil industries.			
11	All graduates trained at the PTQI can be employed by the oil industry			
12	The PTQI often conducts research to improve the performance in the oil industry or to solve problems.			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.2- Curricula

The following statements relate to the curricula adopted for the TVETI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The curriculum has clear aims and objectives			
2	The curriculum correlates directly with the requirements for employment in the oil industry after graduation.			
3	The curriculum offers graduates the quality of skills required by the oil enterprises			
4	The curriculum offers graduates the transportability of skills required by the oil enterprises			
5	The curriculum enables graduates to develop problem-solving skills effectively.			
6	The curriculum enables graduates to develop decision-making skills effectively.			
7	The curriculum facilitates the development of an educational background that can be applied to different fields			
8	The curriculum provides adequate training prospects to enhance effective educational learning			
9	The curriculum makes provision for understanding a career in the oil industry			
10	The Libyan curriculum is highly competitive with the curricula of other countries			
11	The curriculum facilitates the development of coordination skills.			
12	The curriculum keeps abreast of technological advances in the oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

### 2.3- Teaching and learning

The following statements relate to teaching and learning in the PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	Teaching materials are consistently updated in accordance with the new emerging knowledge.			
2	Workshops and practical sessions are often equipped with new technology			
3	The teaching and learning process is suitably assessed at every level			
4	The teaching strategy accurately reflects developments in the field			
5	The teaching programme provides opportunities to develop skills as successful learners			
6	The teaching and learning programme provides opportunities to develop confidence within the field			
7	The teaching and learning programme provides opportunities to develop skills for dealing with challenges in the field.			
8	Teaching outcomes are assessed and evaluated annually			
9	Students receive good support and help from lecturers			
10	The majority of the students are enthusiastic and interested in the field.			
11	The teaching programme has a good balance with regard to theory and practice			
12	The teaching programme includes regular field trips to oil industries			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.4- Educational resources

The following statements relate to teaching and learning in the PTQI.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The library has good access to electronic journals related to work in the oil industry.			
2	The library is a good source of books and documents related to work in the oil industry.			
3	Lecturers often use journals and books as resources to update their teaching materials.			
4	Lecturers often use journals and books as resources for research only.			
5	Lecturers often encourage students to use journals and books in the library.			
6	There are adequate copies of books in the library to for use by the students			
7	Lecturers often recommend new books for the library to purchase			
8	The PTQI is completely independent in terms of the resources used in practical or workshop sessions.			
9	All the resources required for practical or workshop sessions are located in the training institute's buildings.			
10	Lecturers value the academic achievements of the PTQI.			
11	Lecturers take pride in this institute.			
12	Lecture and practice rooms are suitably equipped with information communication technology of a good standard.			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

## 2.5- Educational Planning and assessment

The following statements relate to planning and assessment.

To what extent do you agree or disagree with the following statements?

		Agree	don't know	disagree
1	The PTQI provides feedback on assessments to improve teaching			
2	The PTQI has adequate plans to improve the effectiveness of the training.			
3	The PTQI is flexible in adopting new teaching techniques			
4	The PTQI regularly reflects on development in order to set clear goals and targets			
5	The PTQI regularly achieves set goals and targets			
6	The PTQI is quick to forecast and provide feedback on changes in the oil industry			
7	Assessments within the PTQI correlate well with a future career in the oil industry			
8	Within the planning process, the PTQI is regularly involved in working with the oil industries			
9	Additional planning time would allow the PTQI students to use assessment methods more effectively			
10	Education planning within the PTQI is good at adopting techniques from foreign institutes			
11	Students are adequately consulted to improve the design of the course			
12	The PTQI is regularly assessed and inspected by the government to improve the educational planning and efficiency			
<p><b>Can you please comment on any issue relevant to the statement above?</b></p>				

**Appendix 2: The Interview**

**Appendix 2: The Interview**

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Dear Manger

The aim of this research is to assess the Technical Education and Training Programme in providing skilled technicians for the National Oil Industry.

This programme is essential not only for the oil industries but also for the Libyan economy, as it is dependent on oil production. Therefore, I would like to ask you to answer the following questions. Your answers will be treated in strict confidence and will be used for the purpose of this research only.

PhD Students

**Ibtihal Yuseif**

Edinburgh Napier University, Scotland, UK

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Name of Organisation:.....

Position:.....

Gender                      Male                      Female

**Clarifying Abbreviations**

**TETP = Technical Education and Training Programme**

**PTQI = Petroleum Training and Qualifying Institute**

<b>PTQI (or the provider of the TET programme )</b>	<b>Oil industries (or the users of the TET programme)</b>
<b>Q1-</b> What is the overall strategy of the PTQI for the TET programme?	<b>Q1-</b> What is the overall strategy of the oil industries for the TET programme?
<b>Q2-</b> How is the strategy being developed?	<b>Q2-</b> How is the strategy being developed?



<b>Q3-</b> How is the strategy reviewed and monitored?		<b>Q3-</b> How is the strategy reviewed and monitored?	
<b>Q4-</b> Does the PTQI involve the oil industries in the planning of the students' admission for the first year, as part of their coordination activities?		<b>Q4-</b> Does the PTQI involve the oil industries in the planning of the students' admission for the first year, as part of their coordination activities?	
Yes	No	Yes	No
<b>Q5-</b> if yes;		<b>Q5-</b> if yes;	
Does the plan of the PTQI address the requirement of the technicians for all the oil industries?		Does the plan address the requirements of the technicians for the oil industries?	
<b>Q6-</b> Do all the PTQI students start their work in the oil industries after graduation?		<b>Q6-</b> Do all the PTQI students start their work in the oil industries after graduation?	
Yes	No	Yes	No
<b>Q7-</b> if yes;		<b>Q7-</b> if yes;	
Can you comment on the arrangement?		Can you comment on the arrangement?	
<b>Q8-</b> Does the PTQI strategy provide training for technicians and engineers?		<b>Q8-</b> Does the PTQI strategy provide training for technicians and engineers?	
Yes	No	Yes	No
<b>Q9-</b> if yes:		<b>Q9-</b> if yes:	
How often is the training regulated in the partnership with the oil industries?		How often is the training regulated in the partnership with the PTQI?	

<p><b>Q10-</b> Can you describe the nature of the coordination between the PTQI and the oil industries?</p>	<p><b>Q10-</b> Can you describe the nature of the coordination between the oil industries and the PTQI?</p>
<p><b>Q11-</b> Do you think the TET programme is effective in providing the graduates with sufficient knowledge and skills for the oil industries?</p>	<p><b>Q11-</b> Do you think the TET programme is effective in providing the graduates with sufficient knowledge and skills for the oil Industries?</p>
<p><b>Q12-</b> How do you assess the TET programme and are there any positive or negative points that you would like to make?</p>	<p><b>Q12-</b> How do you assess the TET programme and are there any positive or negative points that you would like to make?</p>

**Q13-** The knowledge of the students and trainees is vital in enabling them to conceptualise future needs. How do you assess the knowledge of the graduates and trainees when they take up their jobs in the oil industries, in terms of their ability in the following areas. (Choose 'Agree', 'Don't' know or 'Disagree' for each issue.)

	<b>Agree</b>	<b>Don't know</b>	<b>disagree</b>
1- Making correct decisions			
2- Defining needs			
3- Setting objectives			
4- Collecting information			
5- Work alternatives			
6- Identifying alternative solutions			
7- Evaluating options			
8- Identifying problems			
9- Analysing problems			
10- Managing problems			
11- Solving problems			
12- Accepting responsibility			
13- Dealing with difficulties			
14- Engaging in team work			

<b>Q 14</b> Successful administration to deliver the TET programme is an important issue in achieving the objectives of both the PTQI and the oil industries effectively. Therefore, how do you assess the following statements?			
	Disagree	Don't know	Agree
Coordination and consultation between the PTQI and the oil industries prevails when organising technical education			
The PTQI's administration coordinates the activities required by the oil industries with the teaching staff			
The TET programme administration operates annually and is comprehensive			
The TET programme is often accomplished according to the setting up of the target objectives			
The PTQI and the managers of the oil industries often undertake effective evaluation of the academic and training programmes			
The PTQI's administrative staff are able to respond to the oil industries effectively			
The PTQI's administration are aware of their tasks which require coordination with the oil industries			
The PTQI's administration takes responsibility for the annual planning and timetables of the next academic year			
The PTQI and oil industries' administration share the responsibility for the required budget of the next academic year			
The PTQI and the oil industries coordinate effectively on different issues related to the TET programme.			
The PTQI and the oil industries decide the new technology that should be envisaged in the TET programme.			

### Appendix 3: Cross Tabulation and Chi Square values by Category

Categories include technicians, students and teaching staff

Table 1

The PTQI contributes to the supply of a highly qualified workforce for the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	198	8	5	211
	% within Category	93.8%	3.8%	2.4%	100.0%
Students	Count	90	11	7	108
	% within Category	83.3%	10.2%	6.5%	100.0%
Teaching Staff	Count	23	2	0	25
	% within Category	92.0%	8.0%	.0%	100.0%
Total	Count	312	21	12	345
	% within Category	90.4%	6.1%	3.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		10.358 <sup>a</sup>	6	.110	
Likelihood Ratio		10.622	6	.101	
Linear-by-Linear Association		1.255	1	.263	
N of Valid Cases		345			

Table 2

The training institute responds to the oil industries' demands for adequately skilled graduates					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	193	10	7	210
	% within Category	91.9%	4.8%	3.3%	100.0%
Students	Count	100	6	4	110
	% within Category	90.9%	5.5%	3.6%	100.0%
Teaching Staff	Count	23	0	2	25
	% within Category	92.0%	.0%	8.0%	100.0%
Total	Count	317	16	13	346
	% within Category	91.6%	4.6%	3.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		2.731 <sup>a</sup>	6	.842	
Likelihood Ratio		3.669	6	.721	
Linear-by-Linear Association		.255	1	.614	
N of Valid Cases		346			

Table 3

Studying in the PTQI is popular with secondary school graduates					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	177	19	14	210
	% within Category	84.3%	9.0%	6.7%	100.0%
Students	Count	77	21	11	109
	% within Category	70.6%	19.3%	10.1%	100.0%
Teaching Staff	Count	24	1	0	25
	% within Category	96.0%	4.0%	.0%	100.0%
Total	Count	279	41	25	345
	% within Category	80.9%	11.9%	7.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		13.511 <sup>a</sup>	6	.036	
Likelihood Ratio		15.186	6	.019	
Linear-by-Linear Association		.373	1	.541	
N of Valid Cases		345			

Table 4

The training institute provides competent and skilled graduates that benefit the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	197	6	8	211
	% within Category	93.4%	2.8%	3.8%	100.0%
Students	Count	103	3	4	110
	% within Category	93.6%	2.7%	3.6%	100.0%
Teaching Staff	Count	24	1	0	25
	% within Category	96.0%	4.0%	.0%	100.0%
Total	Count	325	10	12	347
	% within Category	93.7%	2.9%	3.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		1.145 <sup>a</sup>	6	.979	
Likelihood Ratio		2.059	6	.914	
Linear-by-Linear Association		.008	1	.928	
N of Valid Cases		347			

Table 5

The PTQI is a justifiable investment for the Libyan government, meeting the requirements of the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	170	38	1	209
	% within Category	81.3%	18.2%	.5%	100.0%
Students	Count	75	26	9	110
	% within Category	68.2%	23.6%	8.2%	100.0%
Teaching Staff	Count	22	3	0	25
	% within Category	88.0%	12.0%	.0%	100.0%
Total	Count	268	67	10	345
	% within Category	77.7%	19.4%	2.9%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		19.689 <sup>a</sup>	6	.003	
Likelihood Ratio		19.471	6	.003	
Linear-by-Linear Association		1.643	1	.200	
N of Valid Cases		345			

Table 6

The PTQI meets the demands of the oil industry for technicians					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	190	16	5	211
	% within Category	90.0%	7.6%	2.4%	100.0%
Students	Count	88	13	8	109
	% within Category	80.7%	11.9%	7.3%	100.0%
Teaching Staff	Count	20	5	0	25
	% within Category	80.0%	20.0%	.0%	100.0%
Total	Count	299	34	13	346
	% within Category	86.4%	9.8%	3.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		10.952 <sup>a</sup>	6	.090	
Likelihood Ratio		10.828	6	.094	
Linear-by-Linear Association		1.927	1	.165	
N of Valid Cases		346			

Table 7

The PTQI provides sufficient advice and scientific/technical support for the oil industries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	158	35	17	210
	% within Category	75.2%	16.7%	8.1%	100.0%
Students	Count	80	21	9	110
	% within Category	72.7%	19.1%	8.2%	100.0%
Teaching Staff	Count	15	9	1	25
	% within Category	60.0%	36.0%	4.0%	100.0%
Total	Count	254	65	27	346
	% within Category	73.4%	18.8%	7.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		6.035 <sup>a</sup>	6	.419	
Likelihood Ratio		5.609	6	.468	
Linear-by-Linear Association		.796	1	.372	
N of Valid Cases		346			

Table 8

The PTQI ensures quality teaching and training are in accordance with the recruitment policy of the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	179	25	7	211
	% within Category	84.8%	11.8%	3.3%	100.0%
Students	Count	91	12	7	110
	% within Category	82.7%	10.9%	6.4%	100.0%
Teaching Staff	Count	23	2	0	25
	% within Category	92.0%	8.0%	.0%	100.0%
Total	Count	294	39	14	347
	% within Category	84.7%	11.2%	4.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		3.459 <sup>a</sup>	6	.749	
Likelihood Ratio		4.434	6	.618	
Linear-by-Linear Association		.063	1	.801	
N of Valid Cases		347			

Table 9

The PTQI is always keen on developing teaching and training in a partnership with the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	174	27	10	211
	% within Category	82.5%	12.8%	4.7%	100.0%
Students	Count	92	7	10	110
	% within Category	83.6%	6.4%	9.1%	100.0%
Teaching Staff	Count	22	2	1	25
	% within Category	88.0%	8.0%	4.0%	100.0%
Total	Count	289	36	21	347
	% within Category	83.3%	10.4%	6.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		7.925 <sup>a</sup>	9	.542	
Likelihood Ratio		8.280	9	.506	
Linear-by-Linear Association		.299	1	.585	
N of Valid Cases		347			

Table 10

The PTQI coordinates with the oil industries on quality assurance for the TETP					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	173	33	4	210
	% within Category	82.4%	15.7%	1.9%	100.0%
Students	Count	91	10	8	109
	% within Category	83.5%	9.2%	7.3%	100.0%
Teaching Staff	Count	20	3	2	25
	% within Category	80.0%	12.0%	8.0%	100.0%
Total	Count	285	46	14	345
	% within Category	82.6%	13.3%	4.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.832 <sup>a</sup>	6	.183	
Likelihood Ratio		8.947	6	.177	
Linear-by-Linear Association		.774	1	.379	
N of Valid Cases		345			

Table 11

All graduates trained at the institute can be employed by the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	186	10	15	211
	% within Category	88.2%	4.7%	7.1%	100.0%
Students	Count	88	4	17	109
	% within Category	80.7%	3.7%	15.6%	100.0%
Teaching Staff	Count	19	3	3	25
	% within Category	76.0%	12.0%	12.0%	100.0%
Total	Count	294	17	35	346
	% within Category	85.0%	4.9%	10.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		9.017 <sup>a</sup>	6	.173	
Likelihood Ratio		8.219	6	.222	
Linear-by-Linear Association		2.151	1	.142	
N of Valid Cases		346			

Table 12

The training institute often conducts research to improve the performance in the oil industry or to solve problems					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	138	46	25	209
	% within Category	66.0%	22.0%	12.0%	100.0%
Students	Count	75	20	15	110
	% within Category	68.2%	18.2%	13.6%	100.0%
Teaching Staff	Count	18	3	4	25
	% within Category	72.0%	12.0%	16.0%	100.0%
Total	Count	232	69	44	345
	% within Category	67.2%	20.0%	12.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		2.412 <sup>a</sup>	6	.878	
Likelihood Ratio		2.829	6	.830	
Linear-by-Linear Association		.237	1	.626	
N of Valid Cases		345			



Table 13

The curriculum has clear aims and objectives					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	180	23	7	210
	% within Category	85.7%	11.0%	3.3%	100.0%
Students	Count	78	8	24	110
	% within Category	70.9%	7.3%	21.8%	100.0%
Teaching Staff	Count	22	1	2	25
	% within Category	88.0%	4.0%	8.0%	100.0%
Total	Count	281	32	33	346
	% within Category	81.2%	9.2%	9.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		30.134 <sup>a</sup>	6	.000	
Likelihood Ratio		28.752	6	.000	
Linear-by-Linear Association		3.350	1	.067	
N of Valid Cases		346			

Table 14

The curriculum is directly related to graduate needs in practice					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	169	33	9	211
	% within Category	80.1%	15.6%	4.3%	100.0%
Students	Count	80	6	24	110
	% within Category	72.7%	5.5%	21.8%	100.0%
Teaching Staff	Count	21	4	0	25
	% within Category	84.0%	16.0%	.0%	100.0%
Total	Count	271	43	33	347
	% within Category	78.1%	12.4%	9.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		33.240 <sup>a</sup>	6	.000	
Likelihood Ratio		33.674	6	.000	
Linear-by-Linear Association		1.501	1	.221	
N of Valid Cases		347			

Table 15

The curriculum offers graduates the quality of skills required by the oil enterprises					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	169	30	12	211
	% within Category	80.1%	14.2%	5.7%	100.0%
Students	Count	84	14	12	110
	% within Category	76.4%	12.7%	10.9%	100.0%
Teaching Staff	Count	22	3	0	25
	% within Category	88.0%	12.0%	.0%	100.0%
Total	Count	276	47	24	347
	% within Category	79.5%	13.5%	6.9%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		5.524 <sup>a</sup>	6	.479	
Likelihood Ratio		7.098	6	.312	
Linear-by-Linear Association		.168	1	.682	
N of Valid Cases		347			

Table 16

The curriculum offers graduates the transportability of skills required by the oil enterprises					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	167	28	16	211
	% within Category	79.1%	13.3%	7.6%	100.0%
Students	Count	81	15	14	110
	% within Category	73.6%	13.6%	12.7%	100.0%
Teaching Staff	Count	22	3	0	25
	% within Category	88.0%	12.0%	.0%	100.0%
Total	Count	271	46	30	347
	% within Category	78.1%	13.3%	8.6%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		5.503 <sup>a</sup>	6	.481	
Likelihood Ratio		7.612	6	.268	
Linear-by-Linear Association		.177	1	.674	
N of Valid Cases		347			

Table 17

The curriculum enables the graduates to develop effective problem-solving skills					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	159	40	11	210
	% within Category	75.7%	19.0%	5.2%	100.0%
Students	Count	83	12	14	109
	% within Category	76.1%	11.0%	12.8%	100.0%
Teaching Staff	Count	22	3	0	25
	% within Category	88.0%	12.0%	.0%	100.0%
Total	Count	265	55	25	345
	% within Category	76.8%	15.9%	7.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		11.620 <sup>a</sup>	6	.071	
Likelihood Ratio		13.028	6	.043	
Linear-by-Linear Association		.063	1	.802	
N of Valid Cases		345			

Table 18

The curriculum enables graduates to develop effective decision-making skills					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	156	38	17	211
	% within Category	73.9%	18.0%	8.1%	100.0%
Students	Count	88	15	7	110
	% within Category	80.0%	13.6%	6.4%	100.0%
Teaching Staff	Count	16	9	0	25
	% within Category	64.0%	36.0%	.0%	100.0%
Total	Count	261	62	24	347
	% within Category	75.2%	17.9%	6.9%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		9.008 <sup>a</sup>	6	.173	
Likelihood Ratio		10.016	6	.124	
Linear-by-Linear Association		.029	1	.865	
N of Valid Cases		347			

Table 19

The curriculum provides a good educational background for the students to progress in their respective fields.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	183	23	3	209
	% within Category	87.6%	11.0%	1.4%	100.0%
Students	Count	87	8	13	108
	% within Category	80.6%	7.4%	12.0%	100.0%
Teaching Staff	Count	23	2	0	25
	% within Category	92.0%	8.0%	.0%	100.0%
Total	Count	294	33	16	343
	% within Category	85.7%	9.6%	4.7%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		20.157 <sup>a</sup>	6	.003	
Likelihood Ratio		19.395	6	.004	
Linear-by-Linear Association		1.071	1	.301	
N of Valid Cases		343			

Table 20

The curriculum provides adequate training prospects for the students to enhance effective educational learning					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	180	24	7	211
	% within Category	85.3%	11.4%	3.3%	100.0%
Students	Count	83	17	10	110
	% within Category	75.5%	15.5%	9.1%	100.0%
Teaching Staff	Count	23	2	0	25
	% within Category	92.0%	8.0%	.0%	100.0%
Total	Count	287	43	17	347
	% within Category	82.7%	12.4%	4.9%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.988 <sup>a</sup>	6	.174	
Likelihood Ratio		9.730	6	.136	
Linear-by-Linear Association		.676	1	.411	
N of Valid Cases		347			

Table 21

The curriculum provides students with adequate opportunities to develop an understanding of how their education will assist them in their careers in the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	170	34	7	211
	% within Category	80.6%	16.1%	3.3%	100.0%
Students	Count	79	18	13	110
	% within Category	71.8%	16.4%	11.8%	100.0%
Teaching Staff	Count	19	4	2	25
	% within Category	76.0%	16.0%	8.0%	100.0%
Total	Count	268	56	23	347
	% within Category	77.2%	16.1%	6.6%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		22.848 <sup>a</sup>	6	.001	
Likelihood Ratio		14.130	6	.028	
Linear-by-Linear Association		2.158	1	.142	
N of Valid Cases		347			

Table 22

The Libyan curriculum is highly competitive with the curricula of other countries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	122	74	14	210
	% within Category	58.1%	35.2%	6.7%	100.0%
Students	Count	68	27	14	109
	% within Category	62.4%	24.8%	12.8%	100.0%
Teaching Staff	Count	12	11	2	25
	% within Category	48.0%	44.0%	8.0%	100.0%
Total	Count	203	112	30	345
	% within Category	58.8%	32.5%	8.7%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.127 <sup>a</sup>	6	.229	
Likelihood Ratio		8.388	6	.211	
Linear-by-Linear Association		1.059	1	.303	
N of Valid Cases		345			

Table 23

The curriculum provides students with effective coordination skills					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	163	41	7	211
	% within Category	77.3%	19.4%	3.3%	100.0%
Students	Count	89	8	13	110
	% within Category	80.9%	7.3%	11.8%	100.0%
Teaching Staff	Count	17	8	0	25
	% within Category	68.0%	32.0%	.0%	100.0%
Total	Count	270	57	20	347
	% within Category	77.8%	16.4%	5.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		21.828 <sup>a</sup>	6	.001	
Likelihood Ratio		22.868	6	.001	
Linear-by-Linear Association		.687	1	.407	
N of Valid Cases		347			

Table 24

The curriculum keeps abreast of technological advances in the oil industries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	134	38	39	211
	% within Category	63.5%	18.0%	18.5%	100.0%
Students	Count	74	15	21	110
	% within Category	67.3%	13.6%	19.1%	100.0%
Teaching Staff	Count	14	8	3	25
	% within Category	56.0%	32.0%	12.0%	100.0%
Total	Count	223	61	63	347
	% within Category	64.3%	17.6%	18.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		5.535 <sup>a</sup>	6	.477	
Likelihood Ratio		5.442	6	.488	
Linear-by-Linear Association		.258	1	.612	
N of Valid Cases		347			

Table 25

The teaching materials are consistently updated in accordance with new emerging knowledge					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	119	62	29	100.0%
	% within Category	56.7%	29.5%	13.8%	109
Students	Count	80	9	19	100.0%
	% within Category	73.4%	8.3%	17.4%	25
Teaching Staff	Count	15	4	6	100.0%
	% within Category	60.0%	16.0%	24.0%	345
Total	Count	215	75	54	100.0%
	% within Category	62.3%	21.7%	15.7%	
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		23.146 <sup>a</sup>	6	.006	
Likelihood Ratio		25.690	9	.002	
Linear-by-Linear Association		.281	1	.596	
N of Valid Cases		345			

Table 26

Workshops and practical sessions are often equipped with new technology					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	139	37	34	210
	% within Category	66.2%	17.6%	16.2%	100.0%
Students	Count	73	18	19	110
	% within Category	66.4%	16.4%	17.3%	100.0%
Teaching Staff	Count	17	5	3	25
	% within Category	68.0%	20.0%	12.0%	100.0%
Total	Count	230	60	56	346
	% within Category	66.5%	17.3%	16.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		1.039 <sup>a</sup>	6	.984	
Likelihood Ratio		1.372	6	.968	
Linear-by-Linear Association		.212	1	.645	
N of Valid Cases		346			

Table 27

The teaching and learning processes are suitably assessed at every level					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	158	43	9	210
	% within Category	75.2%	20.5%	4.3%	100.0%
Students	Count	75	23	12	110
	% within Category	68.2%	20.9%	10.9%	100.0%
Teaching Staff	Count	19	3	2	24
	% within Category	79.2%	12.5%	8.3%	100.0%
Total	Count	253	69	23	345
	% within Category	73.3%	20.0%	6.7%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		6.577 <sup>a</sup>	6	.362	
Likelihood Ratio		6.714	6	.348	
Linear-by-Linear Association		1.181	1	.277	
N of Valid Cases		345			

Table 28

The teaching strategy provides a good basis for predicting how the students will progress in their learning					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	171	30	8	209
	% within Category	81.8%	14.4%	3.8%	100.0%
Students	Count	76	22	12	110
	% within Category	69.1%	20.0%	10.9%	100.0%
Teaching Staff	Count	16	9	0	25
	% within Category	64.0%	36.0%	.0%	100.0%
Total	Count	263	62	20	345
	% within Category	76.2%	18.0%	5.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		20.748 <sup>a</sup>	6	.002	
Likelihood Ratio		19.333	6	.004	
Linear-by-Linear Association		.066	1	.798	
N of Valid Cases		345			

Table 29

The teaching and learning programme provides opportunities for the students to develop their capacities as successful learners					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	184	21	5	210
	% within Category	87.6%	10.0%	2.4%	100.0%
Students	Count	83	13	14	110
	% within Category	75.5%	11.8%	12.7%	100.0%
Teaching Staff	Count	21	4	0	25
	% within Category	84.0%	16.0%	.0%	100.0%
Total	Count	289	38	19	346
	% within Category	83.5%	11.0%	5.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		17.866 <sup>a</sup>	6	.007	
Likelihood Ratio		17.492	6	.008	
Linear-by-Linear Association		2.244	1	.134	
N of Valid Cases		346			

Table 30

The teaching and learning programme provides opportunities for the students to develop their capacities as confident individuals					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	187	20	3	210
	% within Category	89.0%	9.5%	1.4%	100.0%
Students	Count	89	12	9	110
	% within Category	80.9%	10.9%	8.2%	100.0%
Teaching Staff	Count	21	4	0	25
	% within Category	84.0%	16.0%	.0%	100.0%
Total	Count	298	36	12	346
	% within Category	86.1%	10.4%	3.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		12.099 <sup>a</sup>	6	.060	
Likelihood Ratio		11.763	6	.067	
Linear-by-Linear Association		1.676	1	.195	
N of Valid Cases		346			

Table 31

The teaching and learning programme provides opportunities for students to develop their capacities as effective contributors in dealing with challenges					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	154	47	9	210
	% within Category	73.3%	22.4%	4.3%	100.0%
Students	Count	74	24	11	109
	% within Category	67.9%	22.0%	10.1%	100.0%
Teaching Staff	Count	22	3	0	25
	% within Category	88.0%	12.0%	.0%	100.0%
Total	Count	251	74	20	345
	% within Category	72.8%	21.4%	5.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.424 <sup>a</sup>	6	.209	
Likelihood Ratio		9.739	6	.136	
Linear-by-Linear Association		.190	1	.663	
N of Valid Cases		345			

Table 32

The teaching outcomes are assessed and evaluated annually					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	102	95	13	210
	% within Category	48.6%	45.2%	6.2%	100.0%
Students	Count	61	34	15	110
	% within Category	55.5%	30.9%	13.6%	100.0%
Teaching Staff	Count	18	6	1	25
	% within Category	72.0%	24.0%	4.0%	100.0%
Total	Count	182	135	29	346
	% within Category	52.6%	39.0%	8.4%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		14.289 <sup>a</sup>	6	.027	
Likelihood Ratio		14.450	6	.025	
Linear-by-Linear Association		.009	1	.926	
N of Valid Cases		346			

Table 33

The students receive good support and help from the lecturers					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	182	17	11	210
	% within Category	86.7%	8.1%	5.2%	100.0%
Students	Count	77	6	27	110
	% within Category	70.0%	5.5%	24.5%	100.0%
Teaching Staff	Count	25	0	0	25
	% within Category	100.0%	.0%	.0%	100.0%
Total	Count	285	23	38	346
	% within Category	82.4%	6.6%	11.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		33.711 <sup>a</sup>	6	.000	
Likelihood Ratio		35.000	6	.000	
Linear-by-Linear Association		1.770	1	.183	
N of Valid Cases		346			

Table 34

The majority of the students are enthusiastic and interested in the field					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	160	39	11	210
	% within Category	76.2%	18.6%	5.2%	100.0%
Students	Count	70	13	27	110
	% within Category	63.6%	11.8%	24.5%	100.0%
Teaching Staff	Count	16	5	4	25
	% within Category	64.0%	20.0%	16.0%	100.0%
Total	Count	246	57	43	346
	% within Category	71.1%	16.5%	12.4%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		33.036 <sup>a</sup>	6	.000	
Likelihood Ratio		29.835	6	.000	
Linear-by-Linear Association		.042	1	.837	
N of Valid Cases		346			

Table 35

The teaching programme has a good theory and practice balance					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	173	21	16	210
	% within Category	82.4%	10.0%	7.6%	100.0%
Students	Count	85	14	11	110
	% within Category	77.3%	12.7%	10.0%	100.0%
Teaching Staff	Count	22	1	2	25
	% within Category	88.0%	4.0%	8.0%	100.0%
Total	Count	280	36	30	346
	% within Category	80.9%	10.4%	8.7%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		13.018 <sup>a</sup>	6	.043	
Likelihood Ratio		7.642	6	.266	
Linear-by-Linear Association		5.030	1	.025	
N of Valid Cases		346			

Table 36

The teaching programme includes regular field trips to oil industries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	187	9	14	210
	% within Category	89.0%	4.3%	6.7%	100.0%
Students	Count	93	9	8	110
	% within Category	84.5%	8.2%	7.3%	100.0%
Teaching Staff	Count	23	1	1	25
	% within Category	92.0%	4.0%	4.0%	100.0%
Total	Count	304	19	23	346
	% within Category	87.9%	5.5%	6.6%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		2.794 <sup>a</sup>	6	.834	
Likelihood Ratio		2.822	6	.831	
Linear-by-Linear Association		.138	1	.710	
N of Valid Cases		346			



Table 37

The library has good access to electronic journals relating to work in the oil industries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	99	77	35	211
	% within Category	46.9%	36.5%	16.6%	100.0%
Students	Count	66	11	33	110
	% within Category	60.0%	10.0%	30.0%	100.0%
Teaching Staff	Count	6	9	10	25
	% within Category	24.0%	36.0%	40.0%	100.0%
Total	Count	172	97	78	347
	% within Category	49.6%	28.0%	22.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		35.236 <sup>a</sup>	6	.000	
Likelihood Ratio		39.334	6	.000	
Linear-by-Linear Association		3.109	1	.078	
N of Valid Cases		347			

Table 38

The library is a good source of books and documents relating to work in the oil industry.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	134	63	14	211
	% within Category	63.5%	29.9%	6.6%	100.0%
Students	Count	77	16	17	110
	% within Category	70.0%	14.5%	15.5%	100.0%
Teaching Staff	Count	10	6	9	25
	% within Category	40.0%	24.0%	36.0%	100.0%
Total	Count	222	85	40	347
	% within Category	64.0%	24.5%	11.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		29.207 <sup>a</sup>	6	.000	
Likelihood Ratio		26.399	6	.000	
Linear-by-Linear Association		3.875	1	.049	
N of Valid Cases		347			

Table 39

Lecturers often use journals and books as resources to update teaching materials.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	107	75	29	211
	% within Category	50.7%	35.5%	13.7%	100.0%
Students	Count	77	14	19	110
	% within Category	70.0%	12.7%	17.3%	100.0%
Teaching Staff	Count	13	8	4	25
	% within Category	52.0%	32.0%	16.0%	100.0%
Total	Count	197	98	52	347
	% within Category	56.8%	28.2%	15.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		21.500 <sup>a</sup>	6	.001	
Likelihood Ratio		23.423	6	.001	
Linear-by-Linear Association		1.043	1	.307	
N of Valid Cases		347			

Table 40

Lecturers often use journals and books as resources for research only.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	118	64	29	211
	% within Category	55.9%	30.3%	13.7%	100.0%
Students	Count	59	25	24	108
	% within Category	54.6%	23.1%	22.2%	100.0%
Teaching Staff	Count	10	6	9	25
	% within Category	40.0%	24.0%	36.0%	100.0%
Total	Count	187	96	62	345
	% within Category	54.2%	27.8%	18.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		12.806 <sup>a</sup>	6	.046	
Likelihood Ratio		11.988	6	.062	
Linear-by-Linear Association		.588	1	.443	
N of Valid Cases		345			

Table 41

Lecturers often encourage students to use journals and books in the library.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	113	63	35	211
	% within Category	53.6%	29.9%	16.6%	100.0%
Students	Count	81	14	15	110
	% within Category	73.6%	12.7%	13.6%	100.0%
Teaching Staff	Count	19	1	5	25
	% within Category	76.0%	4.0%	20.0%	100.0%
Total	Count	213	78	56	347
	% within Category	61.4%	22.5%	16.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		25.110 <sup>a</sup>	6	.000	
Likelihood Ratio		25.819	6	.000	
Linear-by-Linear Association		8.237	1	.004	
N of Valid Cases		347			

Table 42

There are adequate copies of books in the library for use by the students					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	101	68	41	210
	% within Category	48.1%	32.4%	19.5%	100.0%
Students	Count	61	16	33	110
	% within Category	55.5%	14.5%	30.0%	100.0%
Teaching Staff	Count	6	11	8	25
	% within Category	24.0%	44.0%	32.0%	100.0%
Total	Count	168	95	83	346
	% within Category	48.6%	27.5%	24.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		22.457 <sup>a</sup>	6	.001	
Likelihood Ratio		23.650	6	.001	
Linear-by-Linear Association		.204	1	.651	
N of Valid Cases		346			

Table 43

The lecturers often recommend new books for the library to purchase					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	102	67	42	211
	% within Category	48.3%	31.8%	19.9%	100.0%
Students	Count	68	15	27	110
	% within Category	61.8%	13.6%	24.5%	100.0%
Teaching Staff	Count	12	6	7	25
	% within Category	48.0%	24.0%	28.0%	100.0%
Total	Count	182	88	77	347
	% within Category	52.4%	25.4%	22.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		16.653 <sup>a</sup>	6	.011	
Likelihood Ratio		17.021	6	.009	
Linear-by-Linear Association		2.215	1	.137	
N of Valid Cases		347			

Table 44

The training institute is completely independent in terms of resources used in practical or workshop sessions.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	130	67	14	211
	% within Category	61.6%	31.8%	6.6%	100.0%
Students	Count	76	24	10	110
	% within Category	69.1%	21.8%	9.1%	100.0%
Teaching Staff	Count	17	5	3	25
	% within Category	68.0%	20.0%	12.0%	100.0%
Total	Count	224	96	27	347
	% within Category	64.6%	27.7%	7.8%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		5.564 <sup>a</sup>	6	.474	
Likelihood Ratio		5.917	6	.433	
Linear-by-Linear Association		.123	1	.725	
N of Valid Cases		347			

Table 45

All the resources required for practical or workshop sessions are located in the training institute's buildings.					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	156	36	19	211
	% within Category	73.9%	17.1%	9.0%	100.0%
Students	Count	76	12	22	110
	% within Category	69.1%	10.9%	20.0%	100.0%
Teaching Staff	Count	22	2	1	25
	% within Category	88.0%	8.0%	4.0%	100.0%
Total	Count	255	50	42	347
	% within Category	73.5%	14.4%	12.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		12.748 <sup>a</sup>	6	.047	
Likelihood Ratio		12.838	6	.046	
Linear-by-Linear Association		.370	1	.543	
N of Valid Cases		347			

Table 46

The lecturers value the academic achievements of the training institute					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	177	21	13	211
	% within Category	83.9%	10.0%	6.2%	100.0%
Students	Count	71	23	15	109
	% within Category	65.1%	21.1%	13.8%	100.0%
Teaching Staff	Count	22	2	1	25
	% within Category	88.0%	8.0%	4.0%	100.0%
Total	Count	271	46	29	346
	% within Category	78.3%	13.3%	8.4%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		16.703 <sup>a</sup>	6	.010	
Likelihood Ratio		16.176	6	.013	
Linear-by-Linear Association		1.840	1	.175	
N of Valid Cases		346			

Table 47

The lecturers take pride in this institute					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	178	17	16	211
	% within Category	84.4%	8.1%	7.6%	100.0%
Students	Count	81	17	12	110
	% within Category	73.6%	15.5%	10.9%	100.0%
Teaching Staff	Count	21	4	0	25
	% within Category	84.0%	16.0%	.0%	100.0%
Total	Count	281	38	28	347
	% within Category	81.0%	11.0%	8.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.705 <sup>a</sup>	6	.191	
Likelihood Ratio		10.678	6	.099	
Linear-by-Linear Association		.631	1	.427	
N of Valid Cases		347			

Table 48

The lecture and practical rooms are suitably equipped with information communication technology of a good standard					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	146	36	29	211
	% within Category	69.2%	17.1%	13.7%	100.0%
Students	Count	70	12	28	110
	% within Category	63.6%	10.9%	25.5%	100.0%
Teaching Staff	Count	21	1	3	25
	% within Category	84.0%	4.0%	12.0%	100.0%
Total	Count	238	49	60	347
	% within Category	68.6%	14.1%	17.3%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		11.817 <sup>a</sup>	6	.066	
Likelihood Ratio		12.399	6	.054	
Linear-by-Linear Association		.579	1	.447	
N of Valid Cases		347			

Table 49

The training institute uses annual assessment as a method for evaluating the teaching and learning progress					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	115	84	12	211
	% within Category	54.5%	39.8%	5.7%	100.0%
Students	Count	80	21	9	110
	% within Category	72.7%	19.1%	8.2%	100.0%
Teaching Staff	Count	21	3	1	25
	% within Category	84.0%	12.0%	4.0%	100.0%
Total	Count	217	108	22	347
	% within Category	62.5%	31.1%	6.3%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		20.562 <sup>a</sup>	6	.002	
Likelihood Ratio		22.031	6	.001	
Linear-by-Linear Association		.848	1	.357	
N of Valid Cases		347			

Table 50

The training institute has adequate plans to improve the effectiveness of the training					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	148	54	9	211
	% within Category	70.1%	25.6%	4.3%	100.0%
Students	Count	83	17	10	110
	% within Category	75.5%	15.5%	9.1%	100.0%
Teaching Staff	Count	19	4	2	25
	% within Category	76.0%	16.0%	8.0%	100.0%
Total	Count	251	75	21	347
	% within Category	72.3%	21.6%	6.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		7.506 <sup>a</sup>	6	.277	
Likelihood Ratio		7.823	6	.251	
Linear-by-Linear Association		.168	1	.682	
N of Valid Cases		347			

Table 51

The training institute is flexible in adopting new teaching techniques					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	145	54	12	211
	% within Category	68.7%	25.6%	5.7%	100.0%
Students	Count	81	17	12	110
	% within Category	73.6%	15.5%	10.9%	100.0%
Teaching Staff	Count	20	5	0	25
	% within Category	80.0%	20.0%	.0%	100.0%
Total	Count	247	76	24	347
	% within Category	71.2%	21.9%	6.9%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		9.117 <sup>a</sup>	6	.167	
Likelihood Ratio		10.934	6	.090	
Linear-by-Linear Association		.002	1	.964	
N of Valid Cases		347			

Table 52

The training institute regularly reflects on developments to set clear goals and targets					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	149	52	10	211
	% within Category	70.6%	24.6%	4.7%	100.0%
Students	Count	76	19	14	109
	% within Category	69.7%	17.4%	12.8%	100.0%
Teaching Staff	Count	21	2	2	25
	% within Category	84.0%	8.0%	8.0%	100.0%
Total	Count	247	73	26	346
	% within Category	71.4%	21.1%	7.5%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		11.294 <sup>a</sup>	6	.080	
Likelihood Ratio		11.754	6	.068	
Linear-by-Linear Association		.362	1	.548	
N of Valid Cases		346			

Table 53

The training institute regularly achieves set goals and targets					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	153	50	8	211
	% within Category	72.5%	23.7%	3.8%	100.0%
Students	Count	77	18	14	109
	% within Category	70.6%	16.5%	12.8%	100.0%
Teaching Staff	Count	20	4	1	25
	% within Category	80.0%	16.0%	4.0%	100.0%
Total	Count	251	72	23	346
	% within Category	72.5%	20.8%	6.6%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		11.863 <sup>a</sup>	6	.065	
Likelihood Ratio		11.344	6	.078	
Linear-by-Linear Association		.571	1	.450	
N of Valid Cases		346			

Table 54

The training institute is quick to forecast and provide feedback on changes in the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	131	51	29	211
	% within Category	62.1%	24.2%	13.7%	100.0%
Students	Count	80	17	13	110
	% within Category	72.7%	15.5%	11.8%	100.0%
Teaching Staff	Count	19	6	0	25
	% within Category	76.0%	24.0%	.0%	100.0%
Total	Count	231	74	42	347
	% within Category	66.6%	21.3%	12.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		8.265 <sup>a</sup>	6	.219	
Likelihood Ratio		11.718	6	.069	
Linear-by-Linear Association		.335	1	.563	
N of Valid Cases		347			

Table 55

Assessments within the training institute correlate well with a career in the oil industry					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	138	45	28	211
	% within Category	65.4%	21.3%	13.3%	100.0%
Students	Count	78	19	13	110
	% within Category	70.9%	17.3%	11.8%	100.0%
Teaching Staff	Count	16	8	1	25
	% within Category	64.0%	32.0%	4.0%	100.0%
Total	Count	233	72	42	347
	% within Category	67.1%	20.7%	12.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		4.654 <sup>a</sup>	6	.589	
Likelihood Ratio		5.253	6	.512	
Linear-by-Linear Association		.010	1	.919	
N of Valid Cases		347			

Table 56

Within the planning process, the institute is regularly involved in working with the oil industries					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	136	62	12	210
	% within Category	64.8%	29.5%	5.7%	100.0%
Students	Count	65	32	12	109
	% within Category	59.6%	29.4%	11.0%	100.0%
Teaching Staff	Count	13	11	1	25
	% within Category	52.0%	44.0%	4.0%	100.0%
Total	Count	215	105	25	345
	% within Category	62.3%	30.4%	7.2%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		6.143 <sup>a</sup>	6	.407	
Likelihood Ratio		6.155	6	.406	
Linear-by-Linear Association		1.807	1	.179	
N of Valid Cases		345			

Table 57

Additional planning time would allow the institute's students to use assessment methods more effectively					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	123	69	19	211
	% within Category	58.3%	32.7%	9.0%	100.0%
Students	Count	75	18	16	109
	% within Category	68.8%	16.5%	14.7%	100.0%
Teaching Staff	Count	15	10	0	25
	% within Category	60.0%	40.0%	.0%	100.0%
Total	Count	214	97	35	346
	% within Category	61.8%	28.0%	10.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		15.022 <sup>a</sup>	6	.020	
Likelihood Ratio		18.273	6	.006	
Linear-by-Linear Association		.025	1	.874	
N of Valid Cases		346			

Table 58

The institute is good at adopting techniques from foreign institutes within the education planning					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	111	82	18	211
	% within Category	52.6%	38.9%	8.5%	100.0%
Students	Count	74	20	16	110
	% within Category	67.3%	18.2%	14.5%	100.0%
Teaching Staff	Count	16	8	1	25
	% within Category	64.0%	32.0%	4.0%	100.0%
Total	Count	202	110	35	347
	% within Category	58.2%	31.7%	10.1%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		16.901 <sup>a</sup>	6	.010	
Likelihood Ratio		18.196	6	.006	
Linear-by-Linear Association		.006	1	.940	
N of Valid Cases		347			

Table 59

The students are adequately consulted to improve the design of the course					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	92	50	69	211
	% within Category	43.6%	23.7%	32.7%	100.0%
Students	Count	67	12	31	110
	% within Category	60.9%	10.9%	28.2%	100.0%
Teaching Staff	Count	20	3	2	25
	% within Category	80.0%	12.0%	8.0%	100.0%
Total	Count	180	65	102	347
	% within Category	51.9%	18.7%	29.4%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		20.963 <sup>a</sup>	6	.002	
Likelihood Ratio		22.954	6	.001	
Linear-by-Linear Association		1.156	1	.282	
N of Valid Cases					

Table 60

The training institute is regularly assessed and inspected by the government to improve educational planning and efficiency					
Category		Agree	Don't Know	Disagree	Total
Technicians	Count	88	105	18	211
	% within Category	41.7%	49.8%	8.5%	100.0%
Students	Count	50	41	19	110
	% within Category	45.5%	37.3%	17.3%	100.0%
Teaching Staff	Count	13	11	1	25
	% within Category	52.0%	44.0%	4.0%	100.0%
Total	Count	152	157	38	347
	% within Category	43.8%	45.2%	11.0%	100.0%
		Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square		10.698 <sup>a</sup>	6	.098	
Likelihood Ratio		10.963	6	.090	
Linear-by-Linear Association		.470	1	.493	
N of Valid Cases		347			



- 4- Educational resources - analysing the elements that support the educational process;
- 5- Educational planning and assessment - examining the nature of assessment and planning to improve the teaching and learning process as well as the effectiveness of the training;

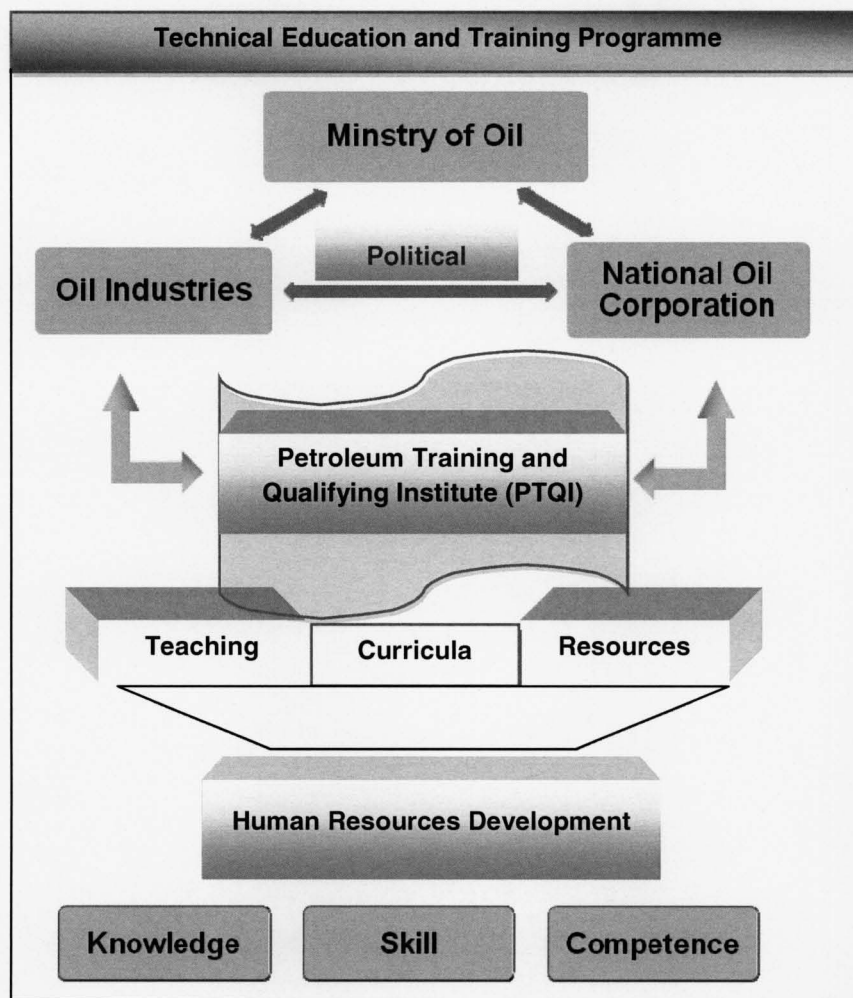


Figure 1.2. Generalised conceptual model for the technical education and training programme

Source: the researcher

- 6- Coordination between the PTQI and oil industry - analysing the partnership between the PTQI and the oil industries when establishing strategies for developing skills and knowledge;

thesis relates to technical knowledge and skills that specifically deal with the activities required by the oil industry. The ultimate value of education is considered to be the transmission of the values and accumulated knowledge of a society.

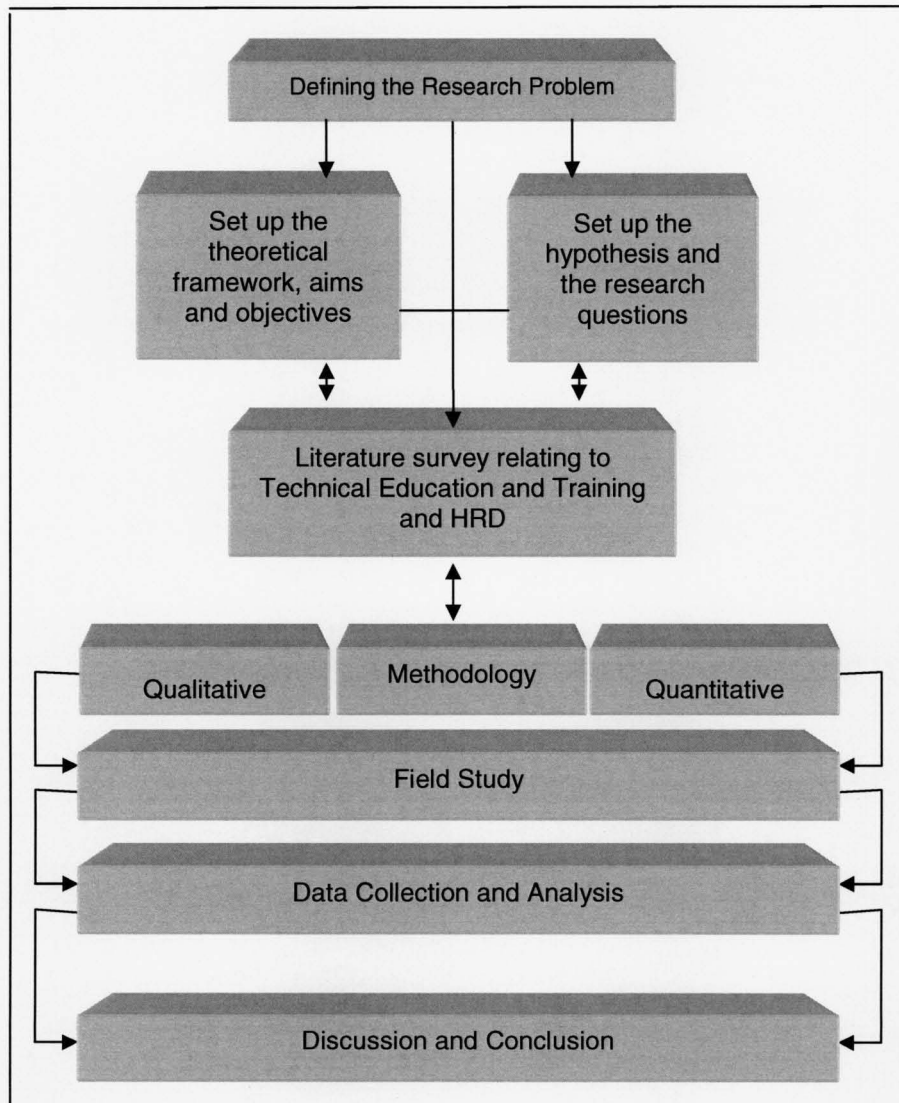


Figure 1.3: General framework of this study.

Source: the researcher

**Human Resources Development (HRD)** – Nadler (1984) defined HRD as planned and structured learning conducted in a definite time period with the aim of increasing the possibility of improving job performance. Therefore, the concept

- The Libyan Context: Background information
- Oil and the Libyan Economy
- An Overview of the Petroleum Training and Qualifying Institute

## 2.2- The Libyan Context: Background information

Libya is one of the North African countries. It is bordered by the Mediterranean Sea in the north, Chad and Niger in the south, Sudan in the south-east, Egypt in the east and Algeria and Tunisia in the west (Figure 2.1). The geographical setting of Libya is characterised by a long coastline of more than 1,770km along the Mediterranean Sea and it has a total area of 1,759,540 sq.km (779,362 sq. miles) (CIA, 2007).



Figure 2.1. Location and main cities in Libya.

Source: Google maps.

of Libyan export values for crude oil, the overall fluctuation in both indicators has been largely influenced by two main factors, namely politics and oil prices.

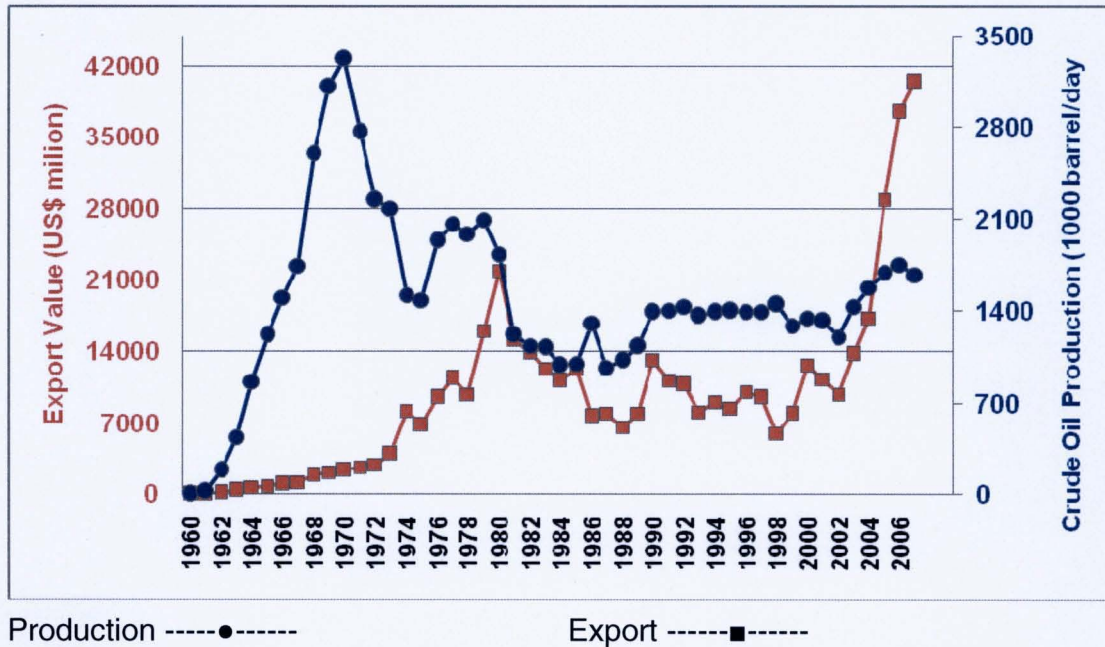


Figure 2.3. Crude oil production and value of exports for 1960-2007.

Source: OPEC (2007) (Data extracted from different tables and combined in this graph).

## 2.4- Petroleum Training and Qualifying Institute

The purpose of the Petroleum Training and Qualifying Institute (PTQI) is to deliver a technical education and training (TET) programme where graduates of the institute can practice before they take up their work in the Libyan oil industries. The aim of the Ministry of Oil is therefore to make sure that the PTQI graduates are equipped with the necessary knowledge and skills to function as a competent workforce in different fields of the oil and gas industries. Hence, the PTQI not only contributes to HRD for the oil and gas industries, but also to the whole of the Libyan economy.

The Libyan government has invested a substantial amount of money and effort in developing the oil and gas sector. Therefore, the PTQI is expected to offer quality services in education and training as well as a transport of skills required for the

courses. Students must pass the basic education with at least an average of 60% in Chemistry, Physics and Mathematics; they also have to pass an interview.

#### 2.4.2- Educational Indicators

Figure 2.4 shows the overall number of students and graduates of the PTIQ between 1999 and 2007. These statistics indicate that the number of students dropped from 2000 to 2005 by an average of 26 students, in comparison to 1999. However, in 2006 and 2007, the number of students showed a gradual increase (by an average of 25 students). This rise in PTQI intake is mainly associated with the oil industries' need for specialist technicians. In addition, as indicated in Figure 2.2, oil production also increased at the beginning of the new millennium. The oil industries in Libya are therefore expanding to cope with demand. Individual student distributions according to the type of field they specialising in are illustrated in Table 2.5.

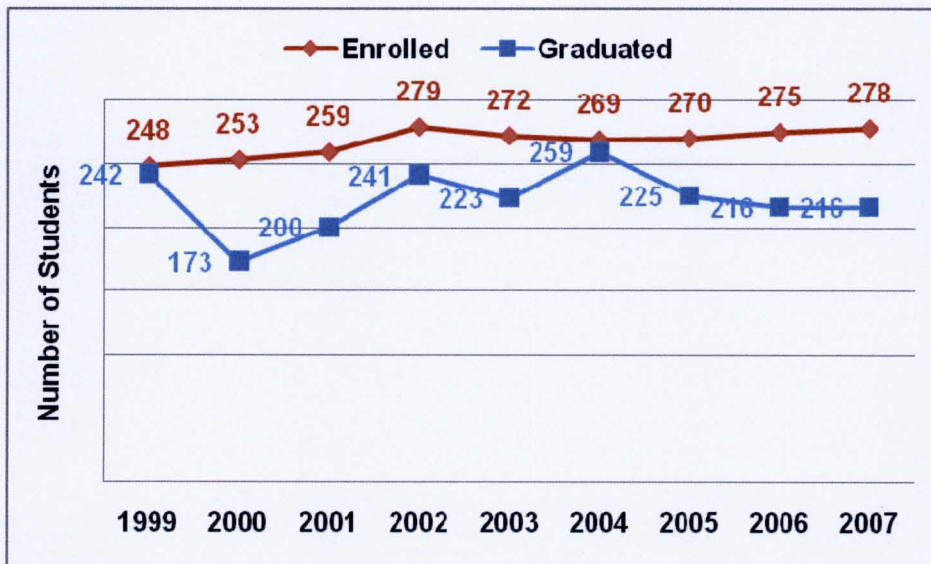


Figure 2.4. Total number of enrolled and graduate students between 1999 and 2007

Data Source: PTQI, 2008

Table 2.5 shows the distribution of enrolled students in the PTQI. This indicates that the number and spread of students did not significantly change between

nature of HRD due to its related disciplines, the literature maintains that HRD involves the integration of training and education to improve individual and organisational effectiveness (Thomson and Mabey, 1994; Craig, 1996). According to Lynton and Pareek (2000), education and training enhance the competency of individuals, and consequently their effectiveness in a task, thereby enhancing the performance of the individual's role in an organisation (p.32).

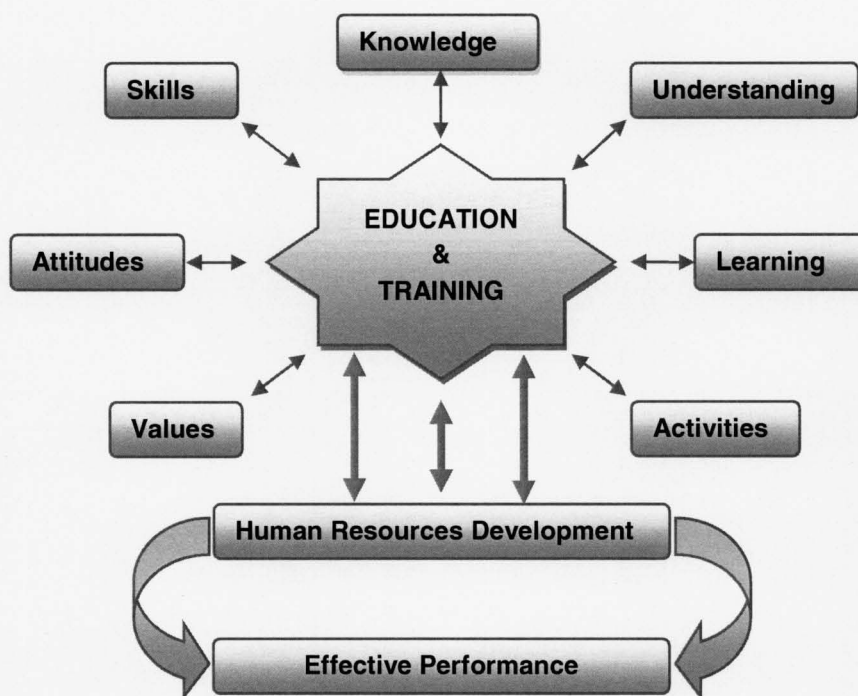


Figure 3.2. Education and Training and their associated elements.

Source: the researcher.

The fast-paced advancement and development in the 1990s and the beginning of the new millennium brought about significant advances in science, technology, education, communication and information systems. Along with the development of human resources, the use of technology became an essential part of the strategies of companies to increase production and check the quality of a product. Therefore, education and training have become essential for many industries in order to keep pace with advances in technology. The oil industries,

#### 4.5- The Development of the Research Techniques

In order to collect the data from the designated sample population, different questionnaires and structured interviews were developed. Both techniques are widely used in social research. The development of these techniques was based on an understanding of the nature of the work in both the PTQI and the Libyan oil industries. In addition, the literature reviews were essential for the development of the research techniques, as they revealed the previous experience of many researchers and their approaches in collecting data. The literature also enabled the researcher to concentrate on the main issues relevant to the research topic. In this respect, Chapter 3 highlighted the different issues, including the elements of education and training. Therefore, the development of the students' knowledge and an understanding of the function and structure of the education and training (TET) programme were essential elements to support the progression of the research techniques.

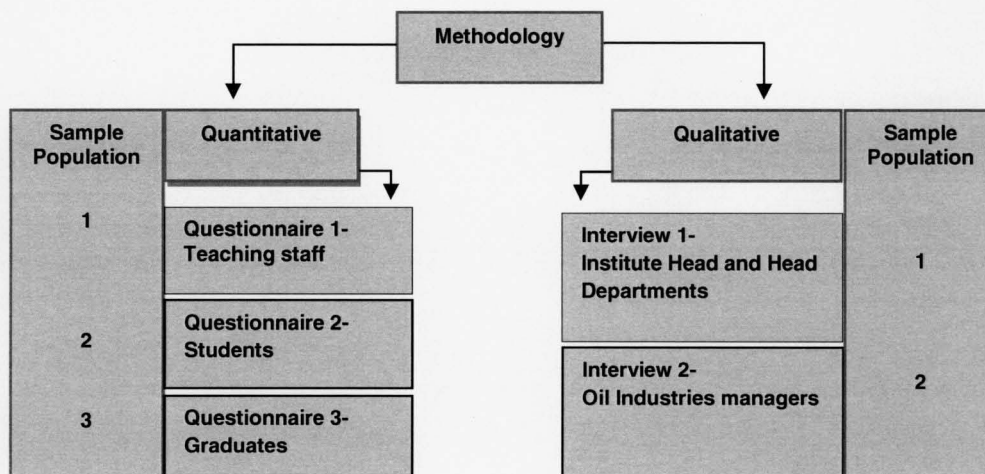


Figure 4.1. Methodological approaches used in this research with the designated sample population.

The literature reveals that most of the methods used in social and educational research are characterised as being descriptive (Cohen, et al., 2000). Best (1970) defined descriptive research according to the conditions or relationships that exist, the practices that prevail, the points of view or attitudes that are held as well as the processes. He added that descriptive research is concerned with