

Managing the influence of adult basic education and training on occupational health and safety in the mining industry

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Mini-dissertation submitted in partial fulfilment of the requirements for the degree *Masters in Business Administration* at the Potchefstroom Campus of the North-West University

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November 2015

DEDICATION

I dedicate this mini-dissertation to my mother Marina de Klerk. You are my role-model and inspiration.

ACKNOWLEDGEMENTS

- First and foremost to my Heavenly Father for his amazing grace;
- To my mother Marina and sister Marlene, for her unconditional love and support;
- To my sons Willem and André, who accompanied me on this journey of lifelong learning. Thank you - I love you dearly;
- To my girls Channel and Lene, for their support, encouragement and love during these past four years;
- To my friends Leanne Prescott and Larna Kirsten, your unconditional love has carried me this far;
- To my manager, Mr. Anton Potgieter, for the encouragement to enrol for an MBA and the ABET staff at Beatrix Mine, for the idea that inspired this study;
- To my study leader, Mr. Johannes C. Coetzee, for his motivation and enthusiasm;
- Ms. Clarina Vorster, for the language and technical editing; and
- Mr. Shawn Liebenberg, from the North-West University, for the statistical analyses.

ABSTRACT

The aim of this research is to establish if there is a correlation between the unacceptable high occupational and health and safety (OHS) records in the South African mining industry and the role of Adult Basic Education and Training (ABET) as a principal catalyst of Occupational Health and Safety (OHS). As few studies have been conducted on Adult education in South Africa, this study focusses specifically on unskilled and illiterate workers. The study is an integrated review of available literature sourced from mine health and safety, adult education and training, education and training in the mining industry and Occupational Health and Safety (OHS) training. The sources refer not only to the historical origins of adult education, but also to contemporary dynamics in its current context, with reference to comparable scenarios and situations.

One of the core concepts is that on an individual level, every person, child, youth and adult should benefit from educational opportunities and this notion has substantial support in literature, as well as the concept that all individuals should have access to lifelong education and training. Adult Basic Education and Training (ABET) has the potential to provide opportunities to capable workers who lack formal education. Therefore, Adult Basic Education and Training (ABET) as well as Occupational Health and Safety (OHS) training policies may require renewal in order to facilitate alternative and additional training, and educational initiatives, required for illiterate underground mine workers.

The review reveals a lack of evidence of effective advocacy and training around generic mining occupational hazards. Health and safety training is most evidently linked to operator training, which is aligned with unit-standards. However, substantial numbers of mineworkers lack adequate formal education for such training programmes, or the informal skills to be included via recognition of prior learning (RPL) processes. Associated skills training outlined in public unit standards, also lack essential elements.

The findings identify key recommendations for an underpinning approach to health and safety training for elementary mineworkers. These are realistic planning and provision of Adult Basic Education and Training (ABET) and Health and Safety Training, ownership, better management of health and safety and improved communication. Additional

findings suggest that the convergent effects of different policies results in the training of the least educated mineworkers being marginalised. The study includes seven propositions that relates to the increased impact that Adult Basic Education and Training (ABET) should have in the mining industry. Compulsory Occupational Health and Safety (OHS) skills programmes for ABET level 4 employees. Accountability for training and the renewal of implementation processes. A public regulatory framework and lastly policies and directives originating from both the mining and the education training sectors to make Occupational Health and Safety (OHS) training a priority intervention for the mining sector. The study concludes with the items that require urgent attention namely, communication, the effects of Health and Safety training and lastly the effects that Adult Basic Education and Training (ABET) has on the mining industry.

KEYWORDS

Adult Basic Education and Training, Department of Mineral Resources, Department of Minerals and Energy, literacy, illiteracy, Department of Labour, Mines Qualification Framework, Recognition of prior learning, Occupational Health and Safety, unskilled and semi- skilled workers, accidents and diseases, South African Mining Industry, Mining Qualification Authority, Health and Safety.

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LIST OF ABBREVIATIONS

ABET	Adult Basic Education and Training (ABET)
AET	Adult Education and Training
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources
DoL	Department of Labour
EFA	Education for All
ETQA	Education and Training Quality Assurer
FET	Further Education and Training
GEAR	Growth, Employment and Redistribution
H&S	Health and Safety
MHSA	Mine Health and Safety Act
MQA	Mines Qualification Framework
NGO	Non-governmental organisation
OHS	Occupational Health and Safety
RDP	Reconstruction and Development Program
RPL	Recognition of Prior Learning
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations International Children's Emergency Fund

CHAPTER 1

1. NATURE AND SCOPE OF THE STUDY

1.1 Introduction

Education in the South African context should be regarded as an essential component of the reconstruction, development and transformation process of the country. The purpose of the government's policy for Adult Basic Education and Training (ABET) must be viewed in conjunction with the broader goal of building a just and equitable education system that ensures and controls good quality education and training to adult learners throughout the country. The Bill of Rights in the Constitution of the Republic of South Africa (1996) emphasises the right of all citizens "to a basic education, including adult basic education, and to further education, which the state, through reasonable measures, must make progressively available and accessible". The White Paper on Education (1995:37) clarifies that "the right to basic education ... applies to all persons, i.e. to all children, youth and adults". Basic education therefor is a legal entitlement to which every person has a claim (Policy Document on Adult Basic Education and Training, 2003:4-5).

Adult Basic Education and Training (ABET) introduces and creates a culture of learning that provides the basis of purposeful and intentional learning with the intent of acquiring the necessary knowledge and skills that is required for social and economic development, thus ensuring that these individuals make a purposeful contribution to the social, economic and political arena in the country. Adult Basic Education and Training (ABET) also provides access to functional literacy, remedial education, and includes in-service, vocational, further and higher education and training and employment. Adult Basic Education and Training (ABET) includes both literacy and post-literacy as the focus is not only on literacy but also on the education of adults to ensure they receive the necessary training and development for income generation purposes. Therefore Adult Basic Education and Training (ABET) can be seen as preceding further education and training (FET). Adult Basic Education and Training (ABET) and further education and training (FET) can be seen as the two components of adult education and training (AET) that systematically initiate adult learners onto a path of lifelong learning and development (Policy Document on Adult Basic Education and Training, 2003:5).

The Department of Education's national definition of ABET in South Africa is:

“Adult basic education and training is the general conceptual foundation towards lifelong learning and development, comprising of knowledge, skills and attitudes required for social, economic and political participation and transformation applicable to a range of contexts. ABET is flexible, developmental and targeted at the specific needs of particular audiences and, ideally provides access to nationally recognised certificates” (Policy Document on Adult Basic Education and Training, 2003:8-9).

From the above definitions of Adult Basic Education and Training (ABET), it is clear that the primary aim of Adult Basic Education and Training (ABET) is a process of voluntary, systematic and organised educational interventions which assists and equips mature individuals. The general conceptual foundation is to facilitate a process of continuous learning and development in order to gain the necessary knowledge, skills and attitudes to optimise their potential and to make the best of life through developing their talents. The efforts to facilitate a process to improve the literacy levels of the citizens of South Africa will ultimately help the country, companies and the Nation to develop as a whole (Sibiya, 2007:6; WHAT IS ABET, 2002:1). For the purpose of this study Adult Basic Education and Training (ABET) can be defined as the education of adults who never received schooling or had partial access to primary and secondary education but never completed grade 12.

Table 1.1 shows the origins of Adult Basic Education and Training (ABET) from 1930 - 1994.

Table 1.1: Origins of Adult Basic Education and Training (ABET)

1930's	Driven by mission schools, church groups and the Communist Party.
1946	Legislation to support and "organise" night schools.
1950's	Nationalist Government undermines night schools.
1966	Establishment of Operations Upgrade.

1970's.	Centres of concern in local churches, first government night schools established, many NGOs established – Project Literacy, Learn & Teach, ELP, USWE, CEP, etc. Unions begin to look at more effective programmes.
1989	Most English language universities establish adult literacy units or departments within the faculty of Education.
Early 1990's	Boom time. IEB sets first adult exams. Massive injections of foreign and local funding (JET in particular). Policy work eventually endorsed and the NQF with a path for lifelong learning and RPL.
ABET INSTITUTIONALISED 1994	ABET prominent in White Paper on education.

Source: Adapted from WHAT IS ABET (2002:1)

From Table 1.1 it is clear that the origins of ABET goes hand in hand with the country's political history and the 1990's shows clear evidence of the progress made in terms of the Policy Framework and publication of the White Paper on Education and Training in 1995.

1.2 Context

Very few studies have been conducted on Adult Basic Education and Training (ABET) in South Africa and subsequently very little literature material is available to form a concise and consistent picture of the state of Adult Basic Education and Training (ABET) in the country. Most of these studies and material available mainly focussed on the provision of Adult Basic Education and Training (ABET) among disadvantaged communities and in workplaces in general.

In 1991 a study was conducted on the provision of Adult Basic Education and Training (ABET) in the industries and mines in South Africa. Van Heerden (1991:21) came to the conclusion that not only is literacy in the workplace a big priority, but also emphasised the focus of the unions on Adult Basic Education and Training (ABET) and highlighted the pressure exerted by unions on employers to provide literacy classes. According to the White Paper on Education and Training published in 1995, every person, child, youth and adult shall reap the advantages of educational opportunities provided to meet their basic needs and that all individuals should have access to lifelong education and training (Sibiya, 2007:1).

The South African mining industry is known for its disturbing Occupational Health and Safety (OHS) record. The number of fatalities and injuries that occurs as a result of fall of ground accidents, transportation related accidents, accidents with explosives or in general mining accidents has been reduced in recent years but is still considered to be too high. Elementary workers (unskilled workers), machinery operators and drivers are of specific concern and are seen as particular categories of workers that are most vulnerable to accidents and diseases and who generally have the lowest levels of formal education and or training. The Mining Qualification Authority (MQA), the education and training authority for the mining and minerals sector, has placed great emphasis on these categories of workers and has highlighted their susceptibility to accidents and diseases. The replacement demand for these categories of workers, due to mortality related occupational and other diseases has been emphasised by the Mining Qualification Authority (Tuchten & Nkomo, 2012:11).

Hence, the primary objective of this study is to consider, from the information to be obtained, if more realistic planning and provision of Adult Basic Education and Training (ABET) is required to add to the understanding of the role of Adult Basic Education and Training (ABET) and in particular to advocate for additional approaches to Adult Basic Education and Training (ABET) and the inclusion of Occupational Health and Safety (OHS) training as part of the Adult Basic Education and Training (ABET) electives. Peer-reviewed literature on the connection between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) in South Africa mining is simply not available, though there are articles in the mining press, some of which made untested claims (Tuchten & Nkomo, 2012:11).

1.3 Causal factors

The 1994 social and political changes in South Africa resulted in a process of transformation in the Education system in the country. The transformation led to the publication of the White Paper on Education and Training in 1995. The White Paper (1995:37-38) recognised Adult Basic Education and Training (ABET) and declared that: Every adult, youth, child and every person shall reap the benefits from educational opportunities addressed and developed to meet their basic needs, and that all individuals will have continuous and lifelong access to education and training.

The above declaration is of extreme importance if one takes into account the imbalances of the past and limited access to education opportunities to the wider population of South Africa. A very large number of black South African adults are still unable to read and write. Because of their subsequent illiteracy they are excluded from numerous forms of information, communication and a wealth of available literature and educational material in all the sectors of education. All stakeholders, including government and industry alike, are at present focussing on learners at the Adult basic education levels so that the needs of not only the individual but that of the Industry and the country is met (Sibiya, 2007:1).

1.4 Importance of the study

In South Africa one of the major perceptions by the unions and business is that education, including adult education, has little purpose and or relevance in life and in work, and that training means teaching routine jobs with no or little attention to knowledge and values. The use of the word ABET can be seen as exclusively South African as ABE or adult basic education is used in the English speaking world. Adult Basic Education and Training (ABET) subsequently originated from adult literacy work. The adoption of Adult Basic Education and Training (ABET), as opposed to *adult literacy work*, was the result of the political struggle informed by research. By adding the *T* showed a commitment to the *integration* of education and training into Adult Basic Education and Training (ABET). Regardless of the achievements of adult literacy work in the apartheid struggle, literacy alone was not seen as an adequate measure to bring about social transformation in the country. The purpose of Adult Education and Training was to offer a suitable adult route to a general education and qualification with the

purpose of significantly improving the quality of life for many South Africans (WHAT IS ABET, 2002:1).

There are currently numerous registered mining qualifications and skills programmes on offer in South Africa and all have to be aligned to the National Qualifications Framework (NQF) and pitched at a particular NQF or educational level. NQF level 1 is the lowest level. It is estimated that 48.9% of all mineworkers leave school before a level equivalent to NQF 1 is obtained. It is further estimated that, across the mining industry, 15.4% of all mineworkers never attended school at all, 37% did not complete primary school and 71% of all employees did not complete their schooling. It is estimated that as much as 80% of underground mineworkers did not complete their schooling at all (Tuchten & Nkomo, 2012:12).

The decline in fatalities can be contributed to the Governments increased focus on safety and greater cooperation and collaboration between both business and labour. Although fatality figures have dropped in recent years, the number of fatalities are still concerning. The greatest impact of mining accidents is not only on the victims, but on the family members that are left behind. Most of these mine workers are breadwinners and leave extended families behind. This study aims to determine the impact of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) and the contribution of Adult Basic Education and Training (ABET) to possibly lower fatalities in the Mining sector through continuous efforts to increase the literacy levels of its workforce. Table 1.2 shows the different ABET levels (1-4) in relation to school equivalences at a NQF Level 1.

Table 1.2: Adult Basic Education and Training (ABET) levels

ABET 1	ABET 2	ABET 3	ABET 4
Grade 3	Grade 5	Grade 7	Grade 9

Source: Adapted from SkyEnglish (2015:1)

1.5 Problem statement

The use of the designation Adult Basic Education and Training (ABET) is uniquely South African. Adult Basic Education and Training (ABET) emerged during policy initiatives of the early 1990's and reasons for adding the "T" showed a commitment to the integration of education and training into Adult Basic Education and Training (ABET).

Explorative research is required in order to question the role of Adult Basic Education and Training (ABET) as a primary driver of mine Occupational Health and Safety (OHS), with specific reference to unskilled workers.

It is assumed that there is a connection between relatively higher levels of formal education and enhanced Occupational Health and Safety (OHS). The opposite assumption is also made in the local mining industry that poor OHS can be directly related to the lack of education amongst the workforce. The school of thought that raising workers' general level of education through Adult Basic Education and Training (ABET) could have a positive impact on mine Occupational Health and Safety (OHS), was first seriously promoted by the Leon Commission in its recommendation that all mining companies move forward the national initiative in Adult Basic Education and Training (ABET) with a view to improving communication in mines, which will in turn result in improved health and safety.

With regards to Adult Basic Education and Training (ABET), there seems to be a problem to establish exactly what the typical outcomes or effects are that ABET has in an industrial context, assuming adequate quality and duration of provision. The question can be asked if Adult Basic Education and Training (ABET) yields personal and organisational benefits. In the same instance, with reference to improved literacy on Occupational Health and Safety (OHS), the question can be asked if adult basic education and training (ABET) practitioners in general aim to contextualise learning, therefor safety and especially health issues will at present probably be discussed or read about in Adult Basic Education and Training (ABET) classes, enhancing participants awareness and mastery of these subjects. The achievements of adult literacy instruction or Adult Basic Education and Training (ABET) of adequate quality can be multiple and varied according to the context in which adult learners elect to apply

such new skills. Consequently, any aspect of an adult's life that is difficult due to a lack of literacy, numeracy and English language skills, such as shopping, communication at work, organising children's education, even being called upon to read out loud in church, may be enhanced by Adult Basic Education and Training (ABET). Such positive effects of Adult Basic Education and Training (ABET) can be generalised to Occupational Health and Safety (OHS) as well as many aspects of the workplace (Tuchten & Nkomo, 2012:11-14).

1.6 Research objectives

1.6.1 Primary research objective

It is therefore the primary research objective of this study to determine if Adult Basic Education and Training (ABET) could have an impact on Occupational Health and Safety (OHS) and to what extent it enhances awareness of Occupational Health and Safety (OHS) in the Mining Industry.

1.6.2 Secondary objectives

The primary research objectives will be realized by meeting the following secondary research objectives:

1. Determine typical outcomes of Adult Basic Education and Training (ABET) in the Mining Industry;
2. Determine if there is a distinction between pre-Adult Basic Education and Training (ABET) and Post-Adult Basic Education and Training (ABET) employees;
3. Determine if a correlation exists between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) awareness in the Mining Industry; and
4. Determine the impact and influence of Adult Basic Education and Training (ABET) On Occupational Health and Safety (OHS) in the Mining industry.

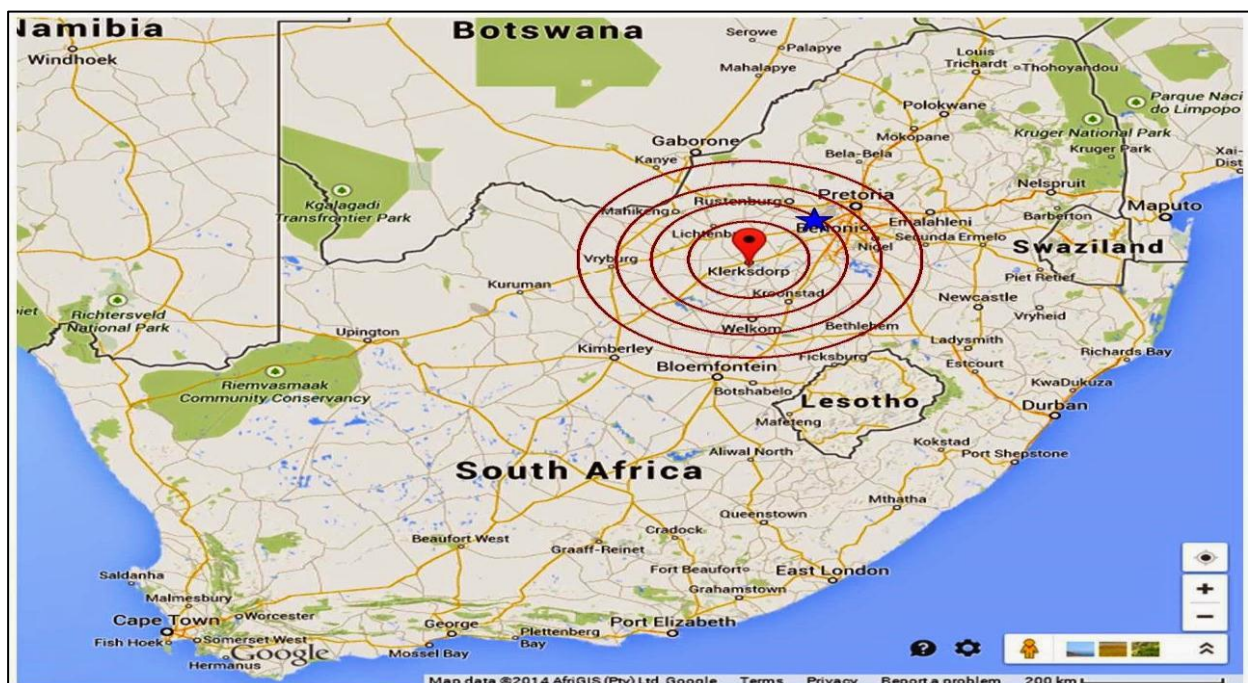
1.7 Scope and study limitations

The study was limited to Adult Basic Education and Training (ABET) centres in Gauteng, Free State and the North West Province as indicated in Figure 1.1. Not all

Adult Basic Education and Training (ABET) Centres in the Industry were included in the study, due to time constraints and other logistical challenges. A convenience sample method had to be applied within five Mining Operational Units. In order to solicit the opinions obtained regarding the impact of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) and if it enhances awareness of Occupational Health and Safety (OHS) in the Mining Industry, a wide selection of Adult Basic Education and Training (ABET) Learners, Adult Basic Education and Training (ABET) Facilitators, Training staff, Supervisors, Line Managers and Senior Management were included in the study.

Since the researcher was not able to reach out to the entire population, the investigation was limited to a small sample which is representative of the population into which research findings are generalised. Subsequently statistical inference to the study population should be considered with the necessary caution. Literature sources with regards to the secondary objectives are limited and restricted to sources generally available in South Africa, libraries and the Internet.

Figure 1.1: Geographical location of ABET centres



Source: Map data AfriGIS (Pty) Ltd. (2014)

1.8 Research methodology

The research methodology applied in this paper was through the application of a comparative literature review as well as through a quantitative approach in the form of a questionnaire.

1.8.1 Literature review

To establish a solid theoretical background with reference to the problem as stated above, an in-depth literature analysis was conducted with specific reference to the following aspects:

1. The significance of Occupational Health and Safety (OHS) in the Mining Industry;
2. The significance of Adult Basic Education and Training (ABET) in the Mining Industry;
3. The Concept of Adult Basic Education and Training (ABET);
4. Illiteracy in South Africa; and
5. Illiteracy in the Mining Industry.

1.8.2 Empirical investigation

The questionnaires were distributed and gathered by the respective Adult Basic Education and Training (ABET) Managers of the selected Adult Basic Education and Training Centres in the study population with the purpose of ensuring a high return rate of the questionnaires. The study population consisted of Adult Basic Education and Training (ABET) Facilitators, Adult Basic Education and Training (ABET) Learners, Training staff, Supervisors, Line Managers and Senior Management. The results emanating from the empirical investigation were analysed by the Statistical Consulting Services of the North West University. The questionnaires and all other information collected were treated with the necessary confidentiality.

1.9 Dissertation layout

This dissertation is divided into four chapters and presented as follows:

Chapter 1 – Nature and scope of the study

This chapter consists of an introduction to the study, the problem statement, the study objectives, the scope and limitations of the study, research methodology and a chapter summary.

Chapter 2 – Literature review

This chapter presents an in-depth literature review on the significance of Occupational Health and Safety (OHS) in the Mining Industry as well an understanding of the concept of Safety. Historical data regarding safety achievements and the culture of safety in the Mining Industry is also discussed in order to form a platform in understanding the significance of Adult Basic Education and Training (ABET) and stakeholder involvement. The literature review concludes with the importance of literacy in the South African Mining Industry.

Chapter 3 – Empirical Study

This chapter deals with the empirical research methodology applied in the study as well as the development of the Adult Basic Education and Training (ABET) questionnaire for the evaluation of the contribution of Adult Basic Education and Training (ABET) to Occupational Health and Safety (OHS). It furthermore indicates the statistical methods used to analyse the data obtained from the survey as well as the target population and the sample strategy. The information obtained from the empirical study is then discussed in further detail and interpreted based on the results obtained from the statistical analysis conducted.

Chapter 4 – Conclusion and recommendations

In the final chapter the conclusions and recommendations regarding the objectives of the study are given, based on the findings from the empirical investigation and the literature review and information. A thorough evaluation was conducted which confirmed that the study objectives have been addressed.

1.10 Conclusion

The study determines if Adult Basic Education and Training (ABET) has an impact on Occupational Health and Safety (OHS) in the Mining Industry and to what extent Adult Basic Education and Training (ABET) contributes to safety awareness amongst mine employees and in the process also contributes to saving lives. In this chapter the problem being investigated is clearly articulated. In the chapters that follows the impact of Adult Basic Education and Training (ABET) on the Occupational Health and Safety (OHS) of mine employees are elaborated on and discussed.

1.11 Chapter summary

Adult Basic Education and Training (ABET) has the potential to provide opportunities to capable workers who lack formal education, or to respond to people who sincerely want a second chance at education and to better themselves. The recommendation of the Leon Commission regarding Adult Basic Education and Training (ABET) as a primary driver of mine Occupational Health and Safety (OHS) has not proven to be a feasible policy over the past 17 years. Unacceptable high rates of mining incidents, accidents and fatalities together with limited evidence that Adult Basic Education and Training (ABET) reduces mine accidents and fatalities, indicate that the provision of Adult Basic Education and Training (ABET) may require renewal (Tuchten & Nkomo, 2012:14-15).

CHAPTER 2

2. LITERATURE REVIEW

2.1 Introduction

The study of literature contained in this chapter provides an overview of the history of Adult Basic education and training and global trends. The history of adult education and where does it originate from? From the study it is evident that there are different views worldwide as to where and when adult education actually originated. The answer to the question asked has certain implications on how the history of adult education is told and understood by the various stakeholders and policy makers all over the world (Larney, 2006:14).

The origins and long history of Adult education and training can be traced back to the last three hundred years and has in the past being influenced mainly by Western ideas, philosophies and institutions. Adult education and training can also be seen as a social movement that has in the past mainly focused on applying the achievements of science and technology to the overall well-being of mankind (Larney, 2006:14-17).

This chapter looks at the role that the United Nations Educational, Scientific and Cultural Organisation (UNESCO) played in influencing the policies of countries all over the world. The influence of Paulo Freire's writings in promoting Adult Basic Education and Training (ABET) from the point of view that Adult Basic Education and Training (ABET) contributes to individual and human resource development. The chapter also investigated the impact of globalisation on adult education and training and lessons learned from international experiences. The role of Education for All (EFA) and the work of the DeLors Commission was investigated as responses to the growing evidence of the failure of education systems world-wide to reach the poor and disadvantaged as well as the Dakar forum (2000).

The chapter concludes by discussing the impact that Apartheid had and the subsequently high illiteracy rates in the Mining industry as well as the history of Adult education in South Africa, non-governmental organisations (NGOS), the Apartheid state as Adult Education provider and the consequences thereof and the macro-economic policy. The impact of GEAR, the NQF and the formalisation of ABET, the Policy

Document on Adult Basic Education and Training, and Mining conditions in South Africa, the causes of Mine accidents and fatalities and the formal education of mineworkers are also discussed.

2.2 UNESCO

The worldwide formalisation of adult education strategies and future outlooks that took place at the UNESCO International Conferences on Adult Education in Elsinore in 1949, Montreal in 1960, Tokyo in 1972, Paris in 1985 and Hamburg in 1997 can be seen in many ways as a professional show case for adult education. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) convened an International Conference on adult education at Elsinore, Denmark in June 1949. Ten years later the Second World Conference on adult education took place in Montreal from 22 to 31 August 1960. The theme for the conference was Adult education in a changing world. The conference afforded delegates the opportunity to review the development of education over the last ten years and to formulate plans and goals for the future. The importance of the UNESCO international conferences was to consolidate the state of adult education world wide and to put plans for the future on the table that would ultimately lay the foundation for adult education in Africa and South Africa (UNESCO, 1949).

2.3 Paulo Freire

Paulo Freire played an important role in the universal understanding of adult education and as promotor for adult education to be used as a tool for transformation. He can be seen as one of the most influential theorist and practitioners of critical approaches to adult education in modern times and his work is acknowledged worldwide. The work of Paulo Freire in adult education was influenced by the popular cultural movement in Latin America in the 1960's. His work reveals two dominant strands, namely Marxism and Liberation Theology. He is worldwide regarded as the leading figure in the area of critical pedagogy (Larney, 2006:17).

The Freirean approach is unique in the sense that it puts great value on the development of the learner's self-awareness of his or her own power to understand the various tensions within specific social realities, and in other words, what shapes their world and how they make sense of it. The process is often called *conscientisation* and it

focuses on the learner's ability to develop literacy skills and cognitive skills to enable them to critically analyse everyday problems and to find possible solutions in order to assist them to cope with everyday life. The Freirean approach perceives the role of adult education as a shared action that aims for social and political transformation. According to Freire, literacy cannot be approached as a meagre technical skill but should serve as a cultural action for freedom. The focus should be on the central topic of what it means to be a self, and socially, constituted representative. Literacy is regarded as being part of an intervention that includes becoming self-deprecating about the historically fashioned nature of one's experience. Freire emphasised that, should an individual have the ability to name his or her life and social experiences, it enables them to comprehend the broader intricacies of the broader political spectrum (Larney, 2006:18).

2.4 The impact of globalisation on adult education and training and International experiences

The 1970's petroleum crisis was a contributing factor that gave rise to globalisation and subsequently went hand in hand with the implementation of neo-liberal policies in some Western countries, which led to a shift in adult education. It is generally agreed that globalisation has done much to change the traditional role of adult education from a focus on the collective good to a highly individualised form of learning that is geared to the needs of the economy. The shift effectively resulted in a form of adult education that focuses on having rather than being, as advocated by the Freirean approach. Adult education has, in a global perspective, taken on a new identity and the agenda is set for adult education rather than by adult education (Griffins, 1987:32; Larney, 2006:21).

This new identity can be contributed to influences mentioned above and below that had a direct impact on how adult education is being offered and structured in countries around the world. In line with the continued pressures from the above-mentioned, the role of international organisations such as the International Monetary Fund (IMF), the World Bank and its Structural Adjustment Policies and UNESCO has fashioned the educational thinking of most governments around the world. South Africa will have to align with literacy campaigns internationally for the purposes of social transformation, reconstruction and development and also to improve on the delivery of Adult Basic Education and Training (Larney, 2006:21).

In the post independent period in South Africa, various attempts were made to address the problem of non-literacy on the African continent that has been valiant and commendable. At the same time there is much to be learned from experiences in Tanzania, Cuba, India and Nicaragua with regards to maintaining and sustaining such campaigns and to continuously support Adult Basic Education and Training (ABET) (Policy Document on Adult Basic Education and Training, 2003:33).

Throughout modern history literacy campaigns and various methods of promoting Adult education and training have been used by the state as a method to bring about national construction and as a tool for nation building. What differentiate such operations from one another are the national objectives, level of leadership involvement as well as the period and the commitment levels of national resources (The Policy Document on Adult Basic Education and Training, 2015:34).

2.5 Education for all (EFA)

Despite all the efforts made by UNESCO to consolidate and formulate plans to develop and implement adult education around the world, they could not measure any tangible successes and subsequently the forum for Education for All (EFA) was launched in Jomtiem, Thailand, in March 1990 as a direct result of the failure of the education systems to reach the poor and the disadvantaged all over the globe. The Conference was organised jointly by UNESCO, UNICEF, UNDP, UNFPA and the World Bank. More than one-third (960 million) of the world's adult population cannot read, write or count and this fact resulted in the growing disparity between rich and poorer nations. At the World Conference on Education for All (WCEFA) the future of education was discussed and the need for extra resources was identified. EFA provided countries with a broad vision of the basic education requirements and has to ensure that the basic learning needs of children, young people and adults, throughout life, within and outside the formal school system, are met. EFA agreed on the necessity of providing education for all, both on ethical and economic terms, and this further reaffirmed the obligation of governments to provide EFA as a societal objective. EFA adopted an inclusive and broad concept of education from early childhood through to continued learning throughout life. EFA also adopted and promoted all kinds of delivery systems, whether they offer formal, non-formal or informal education. To African countries the prospect of

eradicating illiteracy through EFA was an opportunity not to be missed (Larney, 2006:24-25).

The Africa continent, including South Africa, is now offered an opportunity to eradicate illiteracy with the help and support of the international community. The onus is now on the country to provide a clear and concise strategy and to ensure that the implementation thereof is effective and based on a methodological and rational approach (Thiam, 1990:503).

One of the consequences of Education for all (EFA) is that it unintentionally centralised policy making in adult education and that fewer stakeholders now have a say in how adult education or basic education policies are to be developed. This has subsequently led to the marginalisation of social movements including the literacy movement itself. The agenda of the EFA is compared to a military operation as the Education for All campaign is seen as superseding other independent educational initiatives including UNESCO's own International Literacy Year in 1990. The consequence of this is that the major international organisations are now in total chaos, which has a direct effect on the role, implementation and future sustainability of adult education in South Africa (Hall, 1996:119; Larney, 2006:25).

2.6 The Delors' commission

Jacques Delors' contributed to the field of education in terms of the global dominance of neo-liberalism and post-modernist fragmentation and thus provided answers to the role that education should play in meeting the challenges of the 21st century. A unique feature of the Delors commission is its admission that globalisation has not contributed to the social and economic uplift of the poor, but only to global unemployment and a greater division between rich and poor countries. The Delors commission focused on the primary role of education as an important lever for socio-economic and cultural-ideological changes. Education can also be seen as a means to facilitate the development of the human race in order to reduce these inequalities. As neo-liberalism has an individualised focus of education, the Delors commission focussed on the primary role education should play, namely the ongoing improvement of knowledge and to bring about personal development and building relationships amongst individuals, groups and nations. The value of personal development should also be seen as the

primary contributor and building block of relationships amongst these groups. The Delors Commission received criticism in that it was too idealistic in terms of the values that they stood for and that these set of values were too difficult to attain in a modern society. These values included the reduction of poverty, ignorance, oppression exclusion and war on a global scale (Larney, 2006:25-26).

2.7 The Dakar forum (2000)

In 2000 the International Consultative Forum for Education for All, a body created in 1991 to monitor the implementation of EFA (Education for All), organised the Dakar Forum on *Education for All*. Concerns were raised that the goals set out in Jomtiem, namely to ensure that the basic learning needs of children, young people, and adults are met, were not achieved and that there was an unprecedented growth in poverty throughout the world (Larney, 2006:26-27).

The question can now be asked if UNESCO lived up to its reputation as conscience keeper of universal literacy. It seems as if UNESCO lost focus and that the leadership shifted to countries rich in resources and less passionate about adult education (Larney, 2006:27).

In terms of the South African perspective, the extent of the international influences is to be taken into consideration and should be aligned to current practices, and the extent thereof has to be measured to establish compliance to international standards and practices.

2.8 Adult basic education and training in South Africa

2.8.1 The legacy of apartheid and illiteracy

The struggle against Apartheid highlighted the emphasis placed not only on human rights but also on the significance of adult education in South Africa. During the reign of the Nationalist Party government in South Africa very little was done to educate black communities (Sibiya, 2007:12).

When the Nationalist Government came into power in 1948, one of their first priorities was to appoint a commission to formulate the principles, goals and aims of education for Native South Africans as an independent race. Based on the recommendations

made by the commission, the government formulated its legislation in the Bantu Education Act of 1953. The Act was designed in such a manner that it made provision for African education as a separate entity and not as part of the mainstream Educational system in South Africa. Low-quality, separate schooling was proposed for Africans. The philosophy that informed this Act was articulated by the then Minister of Native Affairs at a debate in September 1953. The Apartheid education was mainly designed to ensure identification with rural cultures and to enforce obedience, communal loyalty, ethnic divisions, acceptance of allocated social roles, and identification with rural culture (McKay, 2007:287). The consequences of the Bantu Education Act of 1953 and the net effect that the inferior education system had, and is still having due to high illiteracy rates, are matters of great concern and affect not only the individual but also the country as a whole. This phenomenon is referred to as the Human Capital Theory that assumes a direct positive relationship between education and the Gross National Product of countries. The human capital theory provides a basis or framework for incorporating the economics of education, the economics of discrimination, and the economics of poverty under a microeconomic umbrella named the economics of human resources. The human capital theory is based on the belief that schooled and trained people will be eligible for better jobs with higher salaries than people with no or little schooling. The focus was on the attainment of qualifications. This meant that individuals were now more focussed on investing in their education, training and development to stay competitive.

In the words of the Minister of Native Affairs:

“There is no place for him [the black child] in the European [white South African] community above the level of certain forms of labour . . . Until now he has been subject to a school system which drew him away from his own community and misled him by showing him the green pastures of European society in which he is not allowed to graze.” (Verwoerd, cited in Troup, 1976:22; McKay, 2007:287).

It can be argued that the specific aim of Apartheid and the Apartheid education system was designed to keep Africans in a position of subservience and ignorance and that economically, socially, psychologically and spiritually the education of Black South Africans was controlled by the Apartheid system. The choice that African parents faced was to either place their children in an inferior Bantu education system or to allow them

no education at all. Only one African child in every two of school-going age was actually attending school. Parents were not willing to give up an opportunity to give their children the opportunity to be educated, even if arguably of inferior quality. Between the period 1976 and 1994 attending school was not compulsory and schools were seen as sites to promote the liberation struggle. This resulted in the lack of education for a large portion of the population and subsequently contributed to the great need for Adult Basic Education (ABET) in South Africa. The establishment of democracy in South Africa did little to alleviate the illiteracy rate in the country and there was no real methodology to establish the literacy rates. The fact that the country have 11 official languages made it even more difficult to define literacy within the context of the dominant language of the economy and the communicative practices of adults, who do not speak the dominant language were considered when surveys were conducted nationwide (McKay, 2007:288).

In an attempt to understand the consequence of education in this country, it is thought necessary to take note of the numerous demographic influences that affect education in South Africa. According to the Constitution of South Africa, the country is divided into nine provinces. Each province has its own Legislature, Premier and Provincial Members of Executive Councils. Each province is characterised by its own unique landscape, vegetation, climate and socio-economic issues. Some of these provinces are in the clutch of poverty where providing food and shelter is the main concern and education is placed second on the agenda. Between 1996 and 2001 the proportion of people living in poverty in South Africa has not changed significantly. Households living in poverty have subsequently become increasingly poorer and the breach between rich and poor has broadened by 6.3% (Steyn, Steyn, De Waal, Wolhuter, 2011; Mouton, *et al.*, 2012:1213).

It can therefore be argued that the eradication of poverty should have been the focal point of the new democracy, but instead the focus was placed on changing the education system that only caused the situation to worsen and resulted in the gap being widened between the poor and the rest of the people of South Africa (Nongxa, 2010:11).

The occurrence of poverty in these communities is visible in the schools within these communities. More than half of South Africa's schools have a shortage of classrooms

(almost 65 000 classrooms) and 2, 3 million learners attend schools with no water or water only available within walking distance. As many as 6.6 million learners attend schools without toilets. Approximately 10% of primary schools and around a third of secondary schools have recreational and or sports facilities (Steyn, *et al.*, 2011; Ramphele, 2012:12; Mouton, *et al.*, 2012:1213).

Between 1989 and 1994 South Africa was engrossed in what was referred to as an episode of moral panic due to a political and social threat by young black South Africans. The result of broken homes, boycotted schools, violent streets and a depressed economy was a lost generation of young South Africans living outside of the social structures and lacking the necessary values required to maintain a civilised society. In 1991 the lost generation was estimated at a number between five million to six million people. Some learned authors believe that the high levels of illiteracy also contributed to the lost generation of 1990 – 1994 (Seeking's, 1996:103-122).

In 1996 Government statistics showed that 27% of adults had no schooling at all and that 41% of the adult population had completed some (but not all) primary schooling i.e. the first 7 years of schooling (Statistics South Africa, 1996). The official data shows that by 2002, 54% of the population had completed only some (but not all) primary education (Presidency 2003). An area of great concern is that this group appears to have increased in spite of policy changes and the introduction of compulsory education in the country. There is also a gender difference in illiteracy in that 41% of men and 58% women are considered illiterate. Illiteracy rates are higher in rural areas than in urban areas. South Africa currently has a literacy rate of 86% that can be influenced by current migratory rates (Statistics South Africa, 1996).

During the struggle against Apartheid, the focus was placed on the significance of adult education in the struggle for equity and human rights in South Africa. Now, after a decade of democracy in South Africa, Adult Basic Education and Training (ABET) covers a wide variety of practices and the meaning has changed many times over this period. In some instances reference is made to literacy and numeracy. Adult Basic Education and Training (ABET) is also seen as part of work-related training to ensure that adult learning leads to skills development for the Industry and the country as a whole. Adult Basic Education and Training (ABET) is also regarded as life skills training as it deals with the issues of HIV and AIDS. Prior to 1994, Adult Basic Education and

Training (ABET) was offered by a wide range of providers that ranged from literacy projects by different religious groupings, to university students, worker organisations and political parties, state night schools as well as training provided by different mining companies. Formal technical and vocational training was mostly reserved for white children and learners. Coloured people had access to Technical Colleges and selected schools, while mission schools were mostly reserved for African students. In conclusion, it can be summarised that in the history of adult education, there has never been an agreement on both the concepts of education and a subsequent shift from the Reconstruction and Development Program (RDP) policy to the Growth, Employment and Redistribution (GEAR) policy. The latter emphasised an approach to focus on meeting the skills demand for the economy. After 1994, Adult Basic Education and Training (ABET) was part of nationally driven processes that reformed all aspects of the education and training systems in the country. The newly formed National Qualifications framework (NQF) leads to the convergence of adult education and adult training (Larney, 2006:29-30).

2.9 The history of adult education in South Africa

It was only after 1994 that more attention was given to Adult Basic Education and Training (ABET) in South Africa and the focus was on what types of programmes did adult education providers offer prior to 1994? Adult education has a long history in South Africa that dates back as far as the 1920's and 1930's. The South African Communist Party started off with night schools on the Reef and their aim was to improve their members' English communication skills as well as providing political education. There was however a fairly large variety of adult education being provided prior to 1990, but the provision thereof can be described as marginal, if not somewhat invisible. According to the *National Education Policy Investigation (NEPI) on Adult Basic Education* (1992) and *Adult Education* (1993) before 1990 less than 1% of adult illiterates received any form of literacy training. The investigations brought to light that adult education prior to 1994 was mostly characterised by low demand levels and high dropout rates. Literacy organisations in South Africa under the Apartheid state functioned in a mostly unfriendly environment, where the organisations had to register to be considered lawful in order to receive subsidies from the Government (Larney, 2006:30-31).

2.10 The Apartheid state as adult education provider

After 1976 the Governments' adult classes were conducted at night schools for adult learners who were considered to be at primary level and secondary level. The classes were also very academic of nature and strictly time-based, in most cases endured for 40 weeks and comprised of different courses that depended on the literacy level of the adult learner. Existing school buildings were used to conduct the classes in and were managed by adult centre principals. Some of the teachers employed were teachers of the day school and in most cases not trained in the field of adult education (Larney, 2006:33-34).

In 1982, Edward French embarked on an HRSC survey and the result of the survey found that the courses were not suitable for adult learners as they were too academic. The examination requirements were also not suited for the needs of adult learners at that point in time. Teaching methodologies were very prescriptive and could be compared to the formal schooling system. Academic results led to the attainment of literacy certificates compared to lower primary school standards. The courses that were presented paid very little attention to the practical training needs of the adult learners.

The HRSC survey served to illustrate and elaborate on the attitude of the Department of Education and Training (DET) towards the implementation of "training" at night schools:

"...others have expressed a desire to introduce courses with a practical orientation, but the proponents of the academic approach claim that this is beyond the scope of this section (DET) or is impracticable, and feel it would be rejected by a majority of learners." (Department of Education and Training official as cited in French, 1982:25).

From the above it can be suggested that there was very little, if anything forthcoming from the NGO's or the Apartheid state to address the need for practical training for adult learners. The reason for this can be found in the struggle for legal territory between the Department of Manpower and the Department of Education and Training. This unfortunate state of events has spilt over to the new democratic South Africa. The new democratic government inherited a fragmented system for adult education, with no link between the different state departments or between the state and the private sector or non-governmental organisations. In the Apartheid State there were no nationally agreed standards for adult education provision. This subsequently left adult education in the

country with very little structure and also no measuring tools to rate successes and or failures of the system (Larney, 2006:3-35).

2.11 Non-Governmental organisations (NGOS) between 1970 and 1990

It is important to make a distinction between literacy classes provided by non-governmental organisations (NGOs) and adult education provided by the Apartheid Government from the 1970's onwards (Larney, 2006:32).

According to French (1982) literacy work done by the non-governmental organisation (NGO) sector could be divided into three main groups namely:

1. The non-aligned literacy organisations;
2. The non-aligned training agencies, which mostly provided their services to industry; and
3. The non-profit alternative progressive literacy organisations that played an important role in emancipatory and liberation politics.

The non-aligned literacy organisations consisted of organisations such as the Bureau of Literacy and Literature (BLL/Litsa).

The Bureau of Literacy and Literature (BLL/Litsa) focused on:

- Structured courses with the focus on individualised learning. Learners wrote examinations to reach a literacy level of Standard 4.

Operation Upgrade (established in 1966) focussed on:

- Teaching practical skills, health and religion. The main criticism against Operation Upgrade was that there was not enough political focus and that they were not able to empower and liberate the adult learner.

Other projects included project:

- The Molteno Project;
- Project Literacy; and
- Word to Africa - mainly biblical and evangelical based (Larney, 2006:32).

The strength of these organisations lay in their identification with the struggle and not so much the literacy classes themselves. Other contributors to adult education included university students that promoted the work of Paulo Freire's in terms of the process of conscientisation amongst those involved in the struggle (French, 1992).

2.12 Macro-economic policy context: 1990 – 1997

The early 1990's was greeted with optimism by those involved in adult education. The new democratic government focused on and prioritised the development of policies with specific emphasis on the policies for the adult education sector where policy development was almost non-existent. For those individuals who, in the past were denied access to education, 1990 was a significant year for the following reasons:

- The United Nations declared 1990 as International Literacy Year, with the aim of wiping out illiteracy by the year 2000; and
- The unbanning of the people's organisation that resulted in the release of Nelson Mandela, heralding the end of Apartheid (Larney, 2006:36).

The country's new political framework required new socio-economic development strategies. The documents regarded as the most important that helped frame the post-apartheid, socio-economic policy, as well as governance for a new democratic South Africa, are:

- The Reconstruction and Development Programme (RDP - ANC 1994);
- The Growth, Employment and Redistribution policy (GEAR - ANC 1996); and
- The Constitution of the Republic of South Africa.

In the post 1994 era, socio-economic development was based on either of the two following strategies namely:

- The immediate and equitable redistribution of existing resources

or

- The increase in growth in order to distribute a bigger portion of the resources.

These strategies were translated into macro socio-economic policy framework documents, namely the RDP and GEAR. GEAR was introduced in 1996 and the *Developmental state* was introduced as an additional policy in 2005. The Reconstruction and Development Programme (RDP) directly relate growth to development because growth and development are seen as mutually exclusive. Growth is a priority that precedes development, and development is regarded as a marginal effort of redistribution to the poor (Reitzes, 2009:5). If growth is defined as an increase in output, then it is of course a basic goal. However, where growth occurs, how sustainable it is, how it is distributed, the degree to which it contributes to building long-term productive capacity and human resource development and what impact it has on the environment, are the crucial questions when considering reconstruction and development. The RDP integrates growth, development, reconstruction and redistribution into a unified programme. The key to this link is an infrastructural programme that will provide access to modern and effective services like electricity, water, telecommunications, transport, health, education and training for all the people in South Africa. This programme will both meet basic needs and open up previously suppressed economic and human potential in urban and rural areas (African National Congress, 1994:6).

2.13 Gear and its impact

With the introduction of GEAR the message that the Government was sending out suggested that the social objectives of the RDP, although noble, was not enough to ensure the faster economic growth that was required to provide resources in order to meet the countries' social investment needs.

The expectations informing the macro-economic elements of GEAR were:

- That the current account deficit was a negative restriction on a sustained economic growth; and
- The lack of and negative low levels of domestic savings was a hindrance to increasing the level of investments in the country.

The government's deficit and tax policies can be seen as a contributing factor to the low level of savings (Reitzes, 2009:10).

With the adoption of GEAR, the perception of adult education as a means for reconstruction of the South African society, moved away from a political and revolutionary stance to a social and gradualist position with the focus now on economic growth. The change in focus that was now set on meeting the needs of the economy meant that ABET centres had to adopt and change and by doing so implemented a new curriculum as well as different teaching approaches and methodologies. ABET centres were subjected to different quality assurance systems and new subjects were introduced, namely Economic and Management Science (EMS), Small, Medium and Micro Enterprises (SMME), Technology and Tourism, as well as the teaching of literacy skills at ABET centres (Larney, 2006:37-38).

2.14 The NQF and the formalisation of ABET

The NQF is a framework that utilises nationally recognised levels in order to facilitate lifelong learning opportunities (DoE, 1996:15). The NQF also facilitates an integrated system whereby adult learners can progress from a non-literacy status to accessing further and higher education. The issue of the integration between education and training has resulted in two schools of thought. The ANC and organised labour advocated for an integrated system which saw basic adult education linked to a more generic form of skills training. The Department of Manpower and the Department of Education on the other hand promoted for education and training to exist in a parallel governed structure. For those involved in Adult education, the compromise resulted in two parallel ABET provisioning systems. The one system is driven by the Department of Labour and the other by the Department of Education. For all practical purposes the systems are managed by the NQF by means of facilitating a process of collaboration between the different parties. Areas of responsibilities would include the designing of qualifications, reviewing of the unit standards, quality assurance and monitoring the implementation of qualifications (Larney, 2006:38-39).

2.15 Policy document on adult basic education and training

The National Department of Education is responsible for publishing the policy document on Adult Basic Education and Training (ABET) in South Africa, and the Department is currently in its third year of policy-formulation. All stakeholders that represent Adult Basic Education and Training in South Africa (ABET) have been involved in this process through consultation, debates and other processes necessary to finalise the policy

document. The main purpose of the policy is to assist practitioners and providers, to aggressively promote, implement, monitor and evaluate Adult Basic Education and Training (ABET) practices and in doing so ensure that Adult Basic Education and Training (ABET) occupies a central place in the development of the education and training system (Policy Document on Adult Basic Education and Training, 2003:1).

The primary responsibility of the policy is towards adult learners in South Africa. The policy further makes provision for development on an on-going basis, by creating an enabling environment within which ABET practitioners in the government and other providers such as non-governmental organisations (NGOs) and providers in the economic sector, can co-ordinate their efforts and co-operate across sectors to ensure continuation. It is anticipated that these efforts will generate enough public and private enthusiasm and will to implement a truly South African Adult Basic Education and Training (ABET) system in which all parties contribute to the full extent of their resources and capacity (Policy Document on Adult Basic Education and Training, 2003:1).

The policy document contains a definition of ABET:

“ABET is seen as both a right (as expressed in the National Constitution) and as a functional economic necessity in a changing society which requires a citizenry engaged in a lifelong process of learning”.

The policy is itself shaped by a broader education policy represented in the White Paper of 1995, the National Education Policy Act of 1996 and the South African Qualifications Act of 1995 (Policy Document on Adult Basic Education and Training, 2003:1).

2.16 Origins of the policy framework

The formulation of the policy was part of a bigger process in South Africa, which constructed policy frameworks for all aspects of education and training in the new democratic South Africa. In the early 1990's the following important initiatives took place that assisted in the conceptualization of Adult Basic Education and Training (ABET):

- The National Education Policy Investigation (NEPI) took place under the auspices of the National Education Co-ordinating Committee;

- The Congress of South African Trade Union's Participatory Research Project;
- The National Training Strategy Initiative undertaken by the National Training Board;
- The conference held by the South African committee for Adult Basic Education (SACABE) in November 1993;
- The Implementation plan for Education and Training developed by the Centre for Education Policy development and the African National Congress prior to South Africa's first general election in 1994; and
- The ANC's Education and Training Policy (1994).

In September 1995 the above-mentioned efforts lead to the adoption of a *National Adult Basic Education and Training Framework: Interim Guidelines* as interim policy by the Minister of Education, Prof. Sibusiso Bengu. It was on this foundation that the Department of Education was able to launch its Ithuteng (Ready to Learn) campaign in 1996 as the first ever pilot ABET programme nation-wide. Two key outcomes were delivered through this intervention, namely a common vision for Adult Basic Education and Training (ABET) and agreed curriculum goals (Policy Document on Adult Basic Education and Training, 2003:5).

2.17 Mining and mining conditions in South Africa

The discovery of diamonds on the banks of the Orange River in 1867 heralded the beginning of mining in South Africa. By 1886, gold and diamond rushes established mining as the backbone of the South African economy. The discovery of the world's largest gold deposits in the Witwatersrand, sparked the South African War, or Anglo-Boer War. During this period the techniques for mining in South Africa improved drastically from living canaries for gas-detectors to sophisticated ventilation and chemical extraction of minerals from low-grade ore.

Currently, mining in South Africa:

- contributes 20% to the South Africa's GDP - 50% is contributed directly;
- has a total annual income of approximately R550 billion;
- is one of the country's major employers, with more than one million people in mining-related employment; and

- is the largest contributor by value to black economic empowerment in the economy (Mining in South Africa / Projects IQ, 2015).

The South African mining operations differ from small open excavations, where mineworkers mainly use hand tools, to underground operations that use highly sophisticated and mechanized systems which operate at depths of four kilometres underground. Both quarries and underground operations are regarded as mines and are therefore subjected to the same legislation. A number of factors, namely the depth of the ore, the geometry of the ore body, the physical properties of the rock being mined and the available resources or technologies will inform the methods and working conditions to be used by mining operations. These factors will finally determine if labour-intensive, capital-intensive, underground or surface methods are used for a particular operation. Except for coal, most minerals in South Africa are labour-intensive compared to mines in Australia and Canada and are deep underground mines (Tuchten, 2011:30).

Most of the precious metals mined in South Africa and especially gold occur in the form of tiny particles in huge volumes of hard, quartz matrix, requiring labour-intensive mining methods (Hargrove, 2008:57).

Labour intensive mining methods provide much needed employment opportunities in the country, but also expose more mine employees to hazardous working conditions. In the South African gold mines approximately 84% of employees work underground. In the mining industry across the board, approximately 60% of employees are underground workers, therefore the chances of injuries to illiterate employees increase exponentially (DME, 2008:14; Tuchten, 2011:30).

2.17.1 Safety hazards

Mine Health and Safety literature makes a strong division between hazards and risks. A hazard can be described as the potential to cause harm. Risk on the other hand can be described as the probability of that harm occurring (Aguis, 2015:1; Tuchten, 2011:32).

The major safety hazards in the local mines compare to those across the four biggest sectors namely gold, platinum, coal and diamonds as listed in Table 2.1. The biggest contributor to fatal mine accidents is fall of rock or fall of ground, which is directly linked

to the depth of the mines in South Africa. The transportation of man and material is the second biggest contributor to mine accidents (MHSC, 2009a:25; Tuchten, 2011:32-33).

Table 2.1: Occupational safety hazards in the gold mining sector

Rock falls/ rock bursts as a result of mining depths
Machines coming into contact with persons in confined spaces
Falling materials & rolling rocks
Inundations by mud or broken rocks
Falling into excavations / from structures
Exposure to dust, gases, fumes
Explosions and fires
Seismicity
High temperatures (up to 58°C if uncontrolled)

Source: Adapted from Tuchten (2011:32)

Mine accidents involve lower-grade operators that consist of the majority of labourers and of occupations such as drillers and winch operators. Assumptions are made that, in the mining industry, poor OHS is related to workers not being literate and numerate and the majority of occupational hazards identified in the abovementioned table would affect the lives of illiterate employees. Fatal accidents occur more regularly amongst mineworkers between the ages of 40-49, who have been working underground for a long period (Frankel, 2010:8-9; MHSC, 2009a:2; Tuchten, 2011:32-33).

2.18 Causes of mine accidents and fatalities

Table 2.2 indicates the causes of fatal mine accidents. Human factors should also be taken into consideration with specific reference to the timing of accidents. An analysis conducted by Anglo Platinum revealed that most accidents occur prior or during public holidays for the periods April to May and prior to the Christmas holiday period. The

reasons for this are that workers are distracted by the prospects of the break and in the process lose their focus on safety issues. Production volumes are increased prior to these holidays in order to make up for the losses occurred during these periods (Tuchten, 2011:33-34).

Table 2. 2: Causes of fatal mine accidents 2004-2008

Causes of fatal mine accidents 2004-2008	Number of fatalities
Fall of ground	400
Transportation	250
General (includes falling from heights, mud slides and drowning)	221
Machinery	63
Explosives	25
Electricity	24
Conveyance Accidents	18
Miscellaneous	16
Fire	13
General Heat Sickness	4
Driving Sickness	3

Source: Adapted from Tuchten (2011:33)

Mines in South African are progressively getting deeper as a result of declining grades at current mining depths. This has resulted in increased costs in labour and energy. The cost of affording employees an opportunity to become functionally literate and numerate has directly impacted on the unit cost of mine production and labour as an input cost that has subsequently increased. It has become apparent that the mining industry has

to explore and implement new mining methods that will not only result in increased profitability, but also in improved safety performance. Mining houses have adopted the concept of zero-harm as a safety goal with the aim to protect the wellbeing of its workforce and in the same time maintain high standards of work place health, safety and environmental management. A study conducted by Deloitte (2014) identified five significant challenges facing the South African mining industry. These challenges, described in Table 2.3, were derived at through an understanding of the economic, financial and operational challenges facing the mining industry (Deloitte, 2014:8; Neser 2014:9).

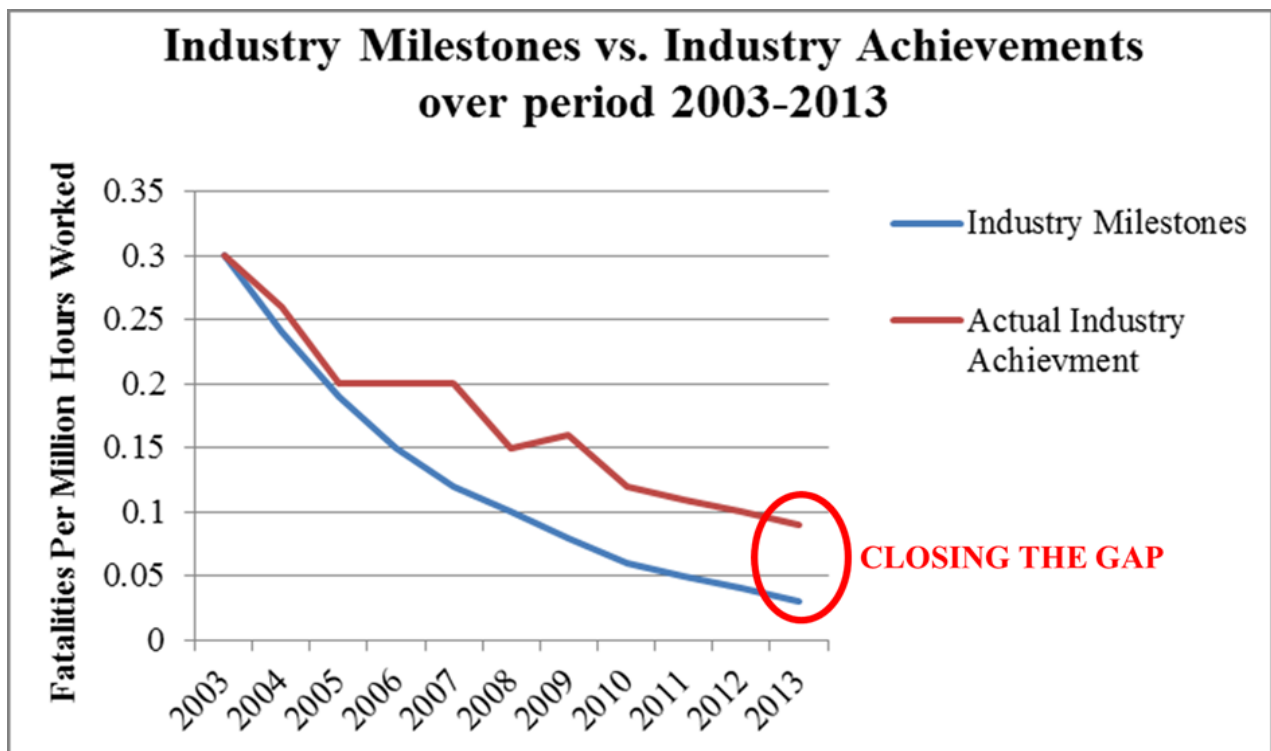
Table 2.3: Top five challenges facing the South African Mining Industry

Challenge	Explanation of Challenge
Profitability & safety performance	Mining companies need to simultaneously defend and grow their profits whilst ensuring that safety performance is not compromised.
Attraction & retention of critical skills	South African tertiary institutions do not have a problem in producing an adequate number of graduates who are eager to take their place in the mining industry.
Capital financing	South African mining operations are cash constrained due to BEE transactions being vendor financed and investors attaching risk premiums to South African mining investments.
Best & most sustainable use of capital	Volatile labour conditions have increased the operating risk of mining operations, resulting in companies increasing their internal requirements for profitability

Conflicting stakeholders	Government, community, business, labour and organised labour are the major stakeholders in the mining industry.
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Source: Adapted from Nesar (2014:10)

Figure 2. 1: Industry milestones versus Industry achievements: 2003-2013



Source: Adapted from Nesar (2014:12)

The above-mentioned graph illustrates that fatalities per million hours worked in the South African mining industry have decreased by a noteworthy 66% due to safety drives and enterprises implemented by the different mining houses in South Africa. The South African Mining Industries safety performance has improved the best compared to that of Australia, the USA and Canada. These countries are the world's most competitive mining industries and are therefore regarded as the international benchmarks. According to the Briggs' (2014) presentation of results, South Africa's safety performance has improved by 66% through safety drives and initiatives, followed by Australia at 64% and the USA at 47%. Canada shows the least improvement at 23%. The relationship between South Africa, Australia, the USA and Canada can be regarded as very competitive and dynamic.

These countries strive towards zero harm in the mining industry which is a continuous challenge for South Africa to compete with these countries as benchmarks. For South Africa the challenge is to reach the yearly milestones to ensure that the gap between the milestones and actual achievements will grow exponentially. New and dynamic initiative for the period 2003 – 2010 provided South African with a great achievement towards meeting mining industry milestones. From 2010 onwards until today there has been a continuous direct drive towards attaining the industry's milestones. The current situation has by all indications not worsened, but in the same time it can be argued that it has not increased either. It can be argued that the South Africa Mining Industry has reached a tipping point in terms of safety performances, but that drastic changes need to be made in order for South Africa to compete with the top mining houses in the world (Neser, 2014:12-13).

Another key element for the South African mining industry is the continued focus on training and development of employees. A learning organisation will continually focus on the external environment in anticipation of proactive adaptations necessary to sustain the business. An internal focus is also required in order to conduct skills analysis, to identify developmental gaps and to put the necessary interventions in place to close the gaps (IAEA, 2002:13; Farmer, 2010:31).

2.19 Achieving a step-change in profitability and safety performance

Deloitte (2014) identified a number of tools that can assist mining executives to appreciate the strategies needed to mitigate the risks generated from industry challenges. Table 2.4 elaborates on the strategies that Mining Companies will have to embrace in order to achieve the desired results in terms of safety and performance.

Table 2.4: Strategies which Mining Companies need to adopt

Tools	Explanation
Long-Term Future & Scenario Planning	Adopt an imaginative and disciplined perspective on futures by focusing on critical uncertainties and possible outcomes.

Company Portfolio Optimisation	Companies need to move beyond prioritizing financial value metrics, such as NPV & IRR, and start to assess tangible and intangible assets of projects.
Intense Innovation	Adopt a leadership strategy, by identifying unusual opportunities.
Proactive Company Stakeholder Relations	Develop a sophisticated, long-term stakeholder map and find common ground.
Adaptive Cost Management	Companies should manage their overhead cost ratios consistently over time, rather than allowing for cyclical cost fluctuations.

Source: Adapted from Nesar (2014:13)

The Mining Industry faces a huge communication challenge owing to disparities in literacy levels and multi-language environments amongst all its stakeholders. Poor communication can not only result in labour unrest but also in unsafe working conditions and environments. Workers' unrest and unhappiness can lead to the disruption of production as workers are often not aware of their employment rights, financial benefits and rewards. Impala Platinum reported to the Revolutionary Communist International Tendency (RCIT) that the numbers for illiterate miners at Lonmin's Marikana were not available. It is estimated that at Marikana Mine about 43% of its own employees are illiterate. Labour unrest, in 2012 at Marikana Mine resulted in multiple fatalities. The high illiteracy levels means that the workforce cannot read the health and safety signage or the first aid, health and safety manuals, notices and literature (Booyens, 2013:1-2; Czernowalow, 2004:1).

2.20 Adult Basic Education and Training (ABET) and mine health and safety in South Africa

According to table 2.5 and with specific reference to the formal education of employees in the mining sector, Adult Basic Education and Training (ABET) and the Mine Health and Safety programmes implemented at the South African mining operations have a lot

of synergy with regards to the socio-demographics of their employees, as most are poor migrant workers with little or no formal schooling or education. The mining industry has a reputation for employing mineworkers who lack formal education because of the physical demands of underground operations. These workers would in all probability not find employment elsewhere. Mine training programmes in the past catered mostly for men and in South Africa the trend is that women are inclined to be better educated than men as compared to other developing countries in the world. The main purpose of Mine Health and Safety training is to develop the health and safety efficacy of workers to perform specific tasks and functions in the execution of their daily work, irrespective of the workers' formal or certificated education (please see Appendix B).

Subsequently health and safety programmes have been designed in such a manner to accommodate workers with limited educational skills and to offer opportunities for further education and training. Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) training originate from very different theoretical and political backgrounds and traditions and remain two fields of study that have not been integrated in the Mining industry to date, thus demanding a multi-disciplinary study.

The concept of multi-disciplinary studies within adult education is not a new phenomenon. With specific reference to adult education on the African continent, research often requires a multi-disciplinary methodology. The research includes a broad spectrum of occupations for example trade union activists, nurses, doctors etc. that would specifically focus on their problems and or issues related to their work. The researchers are required to actively take a stance with regards to their position so as to ensure that their research is not only acceptable in the Africa context but on a global scale as well. It is stressed that the researcher should operate within the boundaries of the specific discipline and related research problems (Tuchten, 2011:89-90; Chilisa & Preece, 2005:74-75).

2.21 Formal education of mineworkers

Underground mine work is very physically demanding and therefore attracts mainly employees that lack any formal education.

The Mining Qualifications Authority (MQA) has recorded the formal education levels of workers across the mining Industry as listed in Table 2.5.

Table 2.5: Formal education of employees in the mining sector

Year	2002	2009
No Schooling	16.3 %	15.4%
Pre-ABET	2.8	3.0
STD 1/ Grade 3/ ABET 1	12.3	5.0
STD 2/ Grade 4	7.0	4.1
STD 3/ Grade 5/ ABET 2	6.7	4.6
STD 4/ Grade 6	6.0	4.9
STD 5/ Grade 7/ ABET 3	8.2	6.9
STD 6/ Grade 8	6.9	5.0
Sub-total	66.2	48.9
STD 7/ Grade 9/ ABET 4/ NQF 1	5.6	6.1
STD 8/ Grade 10	7.9	8.2
STD 9/ Grade 11	4.4	7.8
Matric/ Grade 12/ NQF 4	11.5	19.5
Post-school Qualifications	4.5	9.5
Total	100 %	100 %

Source: MQA (2011:16)

According to Tuchten this provides an uncertain platform to facilitate foundational educational skills for further training, as foundational learning is regarded as the first step to further the education and training of mine workers.

According to the DME (2008:35):

- 15.4 % of all mineworkers never attended school at all;
- 37% of mineworkers did not complete primary school;
- 48.9% of all mineworkers left school before a level equivalent to NQF 1 (Grade 9 or ABET 4) and therefor lack the educational platform for registered qualifications and skills programmes in the mining or other employment sectors; and
- 71% of all employees did not complete their schooling. Estimated figure for underground workers is 80%.

According to the CEO of the MQA, more than 67% of mineworkers are illiterate (Chilwane, 2009:n.p; Tuchten 2011:135). The educational standards used by the Mining Industry to estimate the literacy levels of its employees are subjective, as some employees forgot what they had learned at school while other had advanced their school based learning by operating and functioning in literate environments.

2.22 Conclusion

Even though the provision of compensatory Adult Basic Education and Training (ABET) is a strategic incentive by the MQA, the enrolment of Adult Basic Education and Training (ABET) students in the mining industry has declined over the past five years. In 2005 the numbers of admissions to ABET (Adult Basic Education and Training) submitted from the mines to the MQA for ABET enrolments were 20 339. The major problem with Adult Basic Education and Training (ABET) is the actual implementation thereof, the second biggest problem appears to be limited prospects of reward in terms of further career development, for example admission to learnership programs, employment opportunities and promotional prospects. The most recent programme results are listed in Table 2.6.

Table 2.6: ABET in the Mining Sector: 2009-2010

No. Workers	Enrolled	Completed
Level 4	1 668	519
Level 3	3 527	1 288
Level 2	3 966	1 577
Level 1	4 769	1 687
Total	13 930	5 071

Source: Adapted from Naser (2014:136)

ABET in the mining sector not only faces implementation problems, but the releasing of full time workers to attend full time ABET classes is also problematic, as these workers have to be replaced and this results in a cost implication, not only for the industry but for the workers themselves because they no longer receive payments with regards to bonuses and overtime for the period that they spend in ABET classes. For learners who attend part time classes the physical demands of mining also result in workers being too tired to concentrate after their shift (Tuchten, 2011:136).

There is also no evidence of long-term rewards for ABET: “While Companies are quite positive about the available career-pathing and counselling systems in place, union representatives and employees are quite negative about the systems (or lack thereof) for guidance, counselling and the provision of information on opportunities, etc” (Tuchten, 2011:136).

According to Tuchten (2011:136) “In 1987, David Brown conducted a study of literacy and language on the gold mines. He reported that there was no direct relationship at the time between, leadership amongst unskilled workers and levels of literacy, i.e. no correlation with appointment to menial work or as team leader, and that the majority of people who went to literacy classes did not get promotion”.

2.23 Chapter summary

In this chapter the history of Adult Basic Education and Training (ABET) and related global trends were firstly investigated, as well as the role of various international

organisations and the contribution that Paulo Freire made to promote the universal understanding of adult education, and that it can be used as a tool to bring about transformation. Secondly the role that international organisations and commissions played to facilitate and monitor adult education worldwide was determined. Thirdly, the study focused and highlighted the history of adult education in South Africa and the role that Apartheid played and the subsequent illiteracy amongst certain segments of the South Africa society. Fourthly, the South African Mining Industry and Mining conditions were placed in perspective and the causes of mine accidents were investigated and discussed. Challenges that faces the South African Mining Industry with regards to Occupational Health and Safety (OHS) were investigated and the impacts of Adult Basic Education and Training (ABET) was discussed.

CHAPTER 3

3. RESEARCH METHODOLOGY AND FINDINGS

3.1 Introduction

The literature review in Chapter 2 of this study provided an overview of the origins of Adult Basic Education and Training (ABET) from an International as well as a local perspective. Specific attention was given to policy formulation and the current state of Health and Safety practices in the Mining Industry. The study also considered, from the information obtained, if more realistic planning and provision of Occupational Health and Safety (OHS) and Adult Basic Education and Training (ABET) is required to add to the understanding of the role of Adult Basic Education and Training (ABET). The effect thereof on Occupational Health and Safety (OHS) figures in the Industry, and to also support additional approaches to Adult Basic Education and Training (ABET) and the inclusion of OHS training as part of the Adult Basic Education and Training (ABET) electives, were considered.

The focus of this chapter was on the research methodology conducted to assist in meeting the research objectives as laid out in Chapter 1. The investigation procedures, data analyses as well as the results are described in this chapter. All statistical analyses were done by the Statistical Consultation Services of the North-West University at the Potchefstroom campus.

3.2 Procedure and scope of the quantitative research

The empirical study focused on Adult Basic Education and Training (ABET) Centres in the Mining Industry in South Africa. After determining the demographic profile of all the respondents, the study attempted to establish whether Adult Education and Training (ABET) impacted on Occupational Health and Safety (OHS) and in the same time enhanced awareness of OHS in the Mining Industry. Thirdly the typical outcomes of Adult Basic Education and Training (ABET) in the Mining Industry was investigated in an attempt to determine if there is a distinction between pre-ABET and post-ABET employees. Lastly, the empirical study attempted to determine whether a relationship exists between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) awareness in the Mining Industry. The quantitative method of investigation enabled the researcher to obtain opinions from different people in order to

arrive at a valid conclusion. The information obtained from the respondents was measured by the use of a quantitative research instrument, namely the questionnaire.

The study made use of descriptive statistics due to the emphasis on quantitative research procedures. A quantitative analysis of results was followed since data was gathered from different respondents. Upon receipt of the completed questionnaires the data was prepared for statistical analysis. Missing data was recorded as zeros in all instances. The use of quantitative variables were justified, because data was obtained from different respondents and the questionnaire contained fixed response categories (please see Annexure A). The use of fixed response questions allows the researcher to obtain fairly large amounts of research data in a short space of time and the questions are usually quick and easy to answer. Fixed response questions also allow the researcher to obtain a relatively large sample size, which are representative of the population that the researcher can generalize from (McLeod, 2014:1).

3.3 Procedure and scope of the qualitative research

The researcher also used unstructured questions or open questions where respondents were encouraged to formulate and express their responses freely (please see Annexure A). The comments were analysed in a qualitative style, with the objective to add value to the results obtained from the quantitative research.

3.4 Sample group and size

A population can be described as the total group of potential participants in a research study to whom a researcher would want to generalise the results of an empirical study. (Welman, Kruger & Mitchell, 2010:55). For the purpose of this study the population was the Mining Industry from which a wide selection of Learners, Facilitators, and Training staff, Supervisors, Line Managers and Senior Management were selected from the five Operational Units. A total number of 60 questionnaires were sent out and 57 were returned. A dependency with respect to the Adult Basic Education and Training (ABET) Centres existed in the data. The calculation of a sample size is of great important as it will ensure scientific and statistically significant results (Botha, 2012:41).

In order to solicit the opinions obtained regarding the impact of ABET on Occupational Health and Safety and to determine if it enhances an awareness of OHS in the Mining

Industry from a wide selection of Learners, Facilitators, Training staff, Supervisors, Line Managers and Senior Management, the survey method selected could be considered the most applicable approach to be followed. It can also be considered appropriate to obtain information from and about respondents themselves such as their age, gender etc. and the impact of ABET on OHS. Since the researcher was not able to reach out to the entire population she wished to investigate, she limited her investigation to a small sample which is representative of the population into which research findings were generalised.

It is imperative to mention that the method of selecting a sample is very important for the whole research process. In the study conducted it was necessary to use a non-probability convenience sample from the study population. A convenient sample is a method of collecting data from members of the study population conveniently available to participate in the study and is a means to collect data quickly and very effectively, due to very little variation in the study population (Botha, 2012:41-42).

Equation 3.1 is representative of an equation normally used to calculate a sample size that is required to be representative of the population in a research study when random sampling was used. Since the author used a non-probability convenience sample in this study, Equation 3.1 is thus not relevant as some members of the study population had no chance of being selected (Welman, *et al.*, 2010:67; Botha, 2012:42-43). Due to the demographic profile of the sample, it was established during the study that the sample was indeed representative of the population. A total number of 60 questionnaires were sent out and 57 were returned.

Equation 3. 1: Sample size

$$n = \frac{Z^2 \pi (1 - \pi)}{e^2}$$

Where:

n = the sample size required for the given parameters

z = the number of standard deviations for the given accuracy

π = the proportion of sample of interest (a value of 0.5 maximises the sample size, thus minimising the error)

e = the error allowable, for instance, 10% (Levine, *et al.*, 2008:303; Botha, 2012:42-43).

A total of five ABET Centres were targeted for the study. A sample of a total of sixty Facilitators, Adult learners, Training staff, Supervisors, Line managers and Senior management personnel was included in the questionnaires. The questionnaires were subsequently sent out to 60 potential respondents. In this regard, matters referring to the identification of the population to be used in the study, the selection, preparation and administration of the research instruments and the detail of the questionnaires, are of importance.

3.5 Survey instrument

In terms of research methodologies, the general consensus is that there are two schools of thought for the capturing of research information, namely quantitative and qualitative approaches. The quantitative method can be regarded as an objective approach and seeks to precisely measure and analyse the target concept and is less time consuming. The qualitative research approach is a descriptive form of research and is subjective in that the researcher interprets the data, for example answers to open-ended questions made by participants in this particular study (Welman, *et al.*, 2010:207; Botha, 2012:43-44).

The survey instrument used was a questionnaire because it can be used when factual information is required and should be constructed according to certain rules and principles. A well designed questionnaire is the result of a long process of planning the research objectives, formulating the problem and generating a hypothesis. It is important that the questionnaire is well designed as it can enhance the reliability and validity of the data to acceptable tolerances. In this study, questionnaires were used as instruments for gathering data because a questionnaire permits anonymity and allows a person a reasonable amount of time to think about an answer before he or she actually answers the question. It can be given to many people at the same time and provides for uniformity across measurement situations as each person responds to exactly the same questions and last but not least provides data that can be analysed and interpreted with ease. For the purpose of this study questionnaires were sent out to respondents,

namely for the Adult learners, Facilitators, Training staff, Supervisors, Line managers and Senior managers (please see Appendix A). Variables in each questionnaire were divided in three parts. In both of the questionnaires the first part dealt with the personal background which included the name of the Adult Basic Education and Training (ABET) centre and location of the centre, gender, age and qualifications. The second part touched on the relationship between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS). The third part looked at the impact on Adult Basic Education and Training (ABET) and if it enhanced awareness of and Occupational Health and Safety (OHS) in the Mining Industry. The researcher used unstructured or open questions where respondents were encouraged to formulate and express responses freely. Open questions were used to obtain reasons for particular opinions or attitudes adopted by respondents. Open questions were more appropriate than closed questions since they impose no restrictions on the responses. The researcher was then able to determine exactly how the particular respondent interpreted the question. Open-ended questions can be seen as appropriate, with special reference to the compilation of answer categories and can also help to determine more deep rooted expectations, motives and feelings of respondents. The focus can also be to obtain reliable information on sensitive issues through open questions. It can be foreseen that open-ended questions can be time consuming. In order to collect information on respondents' personal background, the researcher had to visit the identified centres. The information was summarised per table per category, namely gender of respondent inclusive of male or female, number of respondents and percentages. The same applied to all other categories, for example the age of the respondent and the ABET centre.

Furthermore the survey method was proposed as the ideal method of collecting information. Typical analysis of large amounts of data included tabulations, figures, regression analysis, correlations and factor analysis and possibly the use of statistical graphics by means of pie and radar charts. Ethical clearance was obtained from the Ethics Committee at the North-West University Research Support office. It was imperative that the researcher should strive to maintain objectivity and integrity whilst conducting the research. This would imply adherence to the highest technical standards in the research. Knowledge, experience and skills in the field of Adult Basic education and Training (ABET) are key issues in conducting the research. It was of utmost

importance to indicate the limits of the findings and the methodological constraints that determined the validity of such findings upon concluding the research. A letter including the ethical clearance and code with an explanation of the purpose of the study was also attached (please see Appendix A). Ten days were allowed to complete the form.

The questionnaire was constructed by the researcher herself and was based on the literature study conducted and reported on in Chapter 2. The questionnaire consisted of four parts namely:

- questions 1 to 6 to determine the demographic profile of the respondents;
- questions 7-34 where the respondent had to indicate his/her agreement in terms of: *Strongly disagree, disagree, neutral, agree and strongly agree*;
- questions 35–50 which were simple yes/no and don't know questions; and
- questions 51-55 which were open-ended questions that reflected subjective comments. These are reported on in a qualitative research manner below.

All Operational Units were asked to complete at least 12 questionnaires and the questionnaires were subsequently sent out to 60 potential respondents, representing five Mining Operational Units. A total of 57 questionnaires representing five Operational units were returned, of which 57 were used to construct the analyses on. A response rate of 86% was achieved for the questionnaires, with 14% exclusions contributing to a total of 57 responses. A number of non-responses were expected and can be contributed to the following reasons:

- demanding workload and responsibilities;
- absence from work; and
- refusal of respondents to answer questions without providing any reasons or explanations (Welman, *et al.*, 2010:73; Botha, 2012:49).

3.6 Results of the demographical profile of respondents

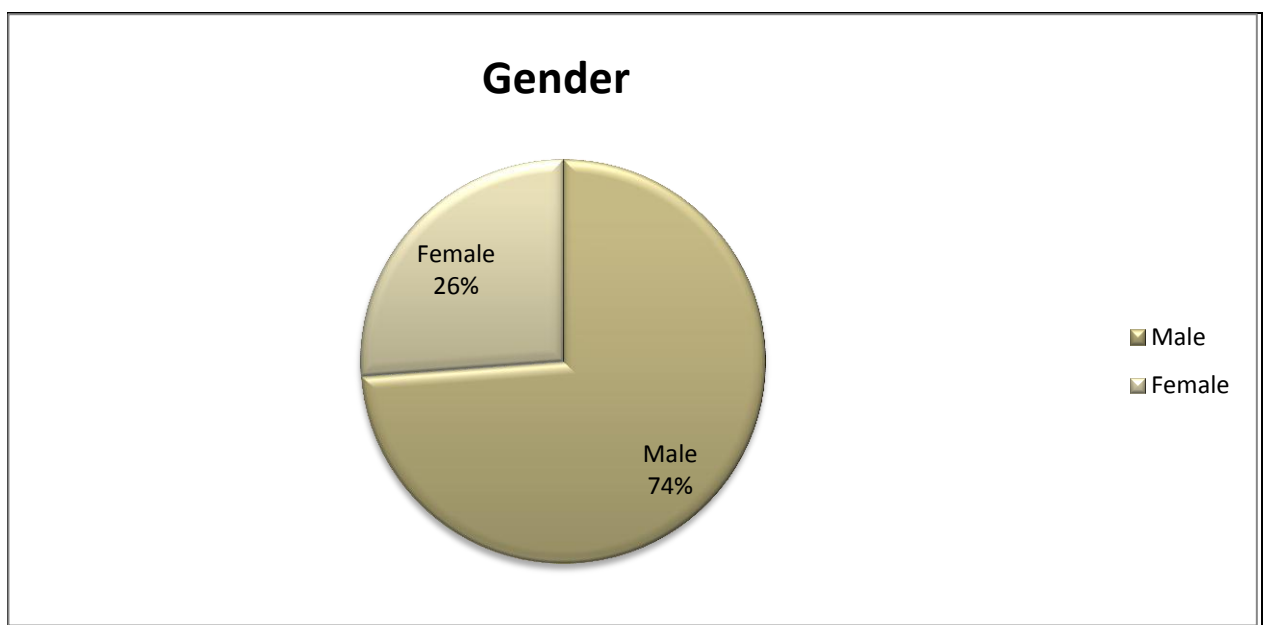
The demographical analysis of the sample that was used in the survey (n = 57) is discussed in this section. The variables examined consisted of the gender, age, race, qualifications, ABET centres and the respondent's position in the organisation of the total sample that was used.

3.6.1 Gender distribution

Figure 3.1 illustrates the gender distribution of respondents who participated in the study. The majority of respondents who participated in the survey were males (74%) compared to the (26%) female respondents.

This was not an unexpected outcome as the majority of the workforce in the mining industry is still predominantly male. Males currently dominate approximately 90% of positions in the Mining Industry.

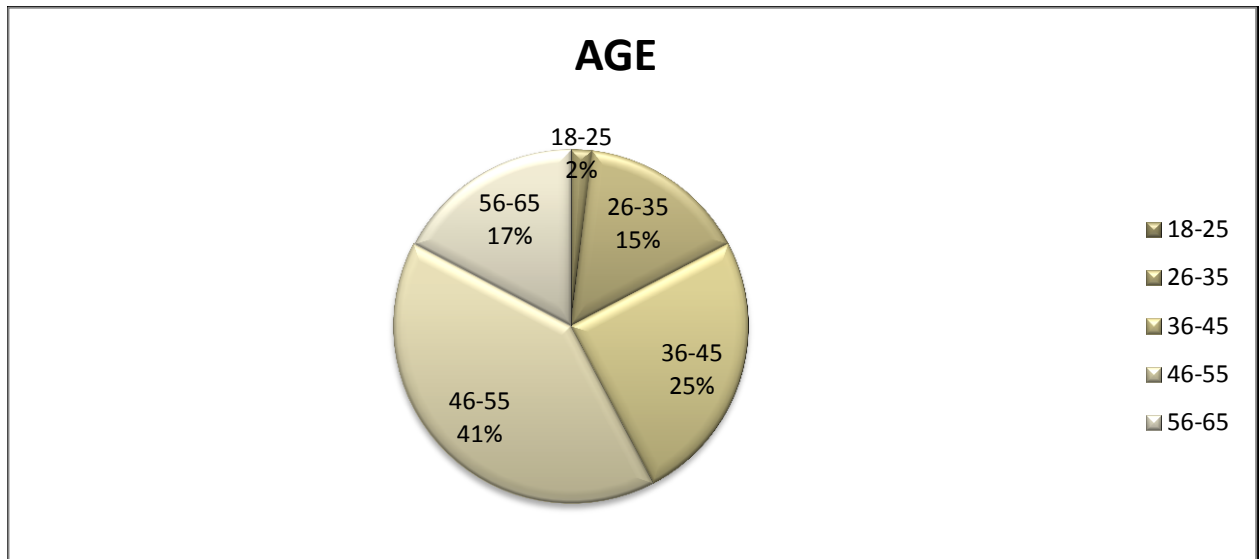
Figure 3. 1: Gender distribution



3.6.2 Age distribution

Figure 3.2 shows the age distribution of respondents which does not indicate a fairly equal spread, with the highest percentage of respondents being between the ages of 46 and 55 (41%) and between 36 and 45 (25%). The lowest percentages varied from 56-65 (17%) and 18-25 (2%). The statistic is generally representative of an aging workforce in the mining industry that relates to loss of skills and knowledge in an ever declining industry.

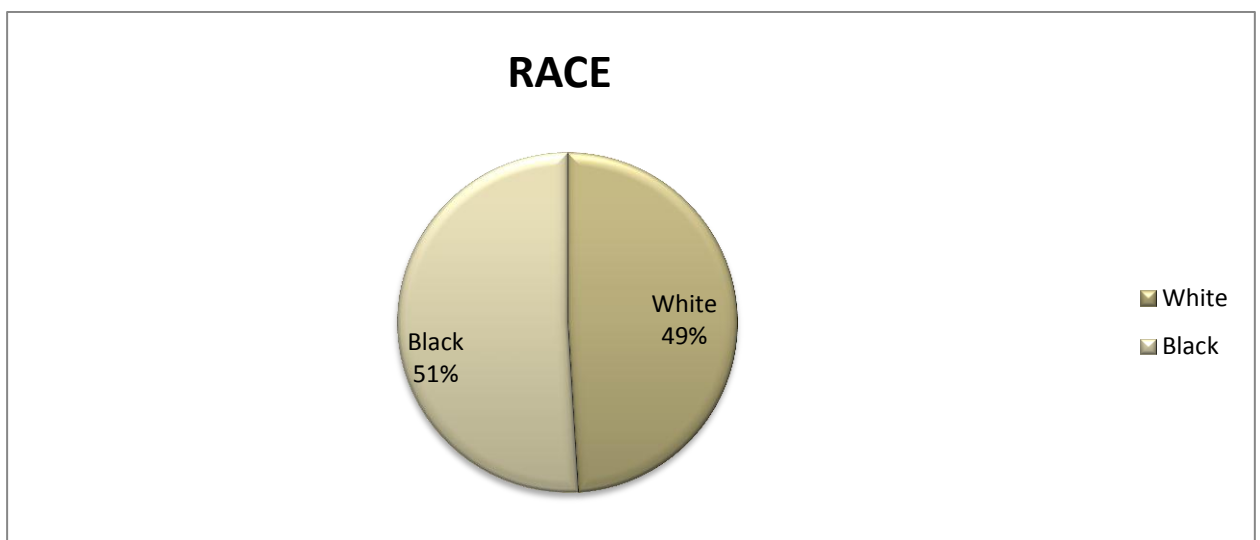
Figure 3. 2: Age distribution



3.6.3 Race distribution

The race distribution is indicated in figure 3.3 and shows that the majority of respondents are black employees (51%) and white employees are 49%. Although coloureds and Indians were included in the survey, no responses were received from those specific race groups.

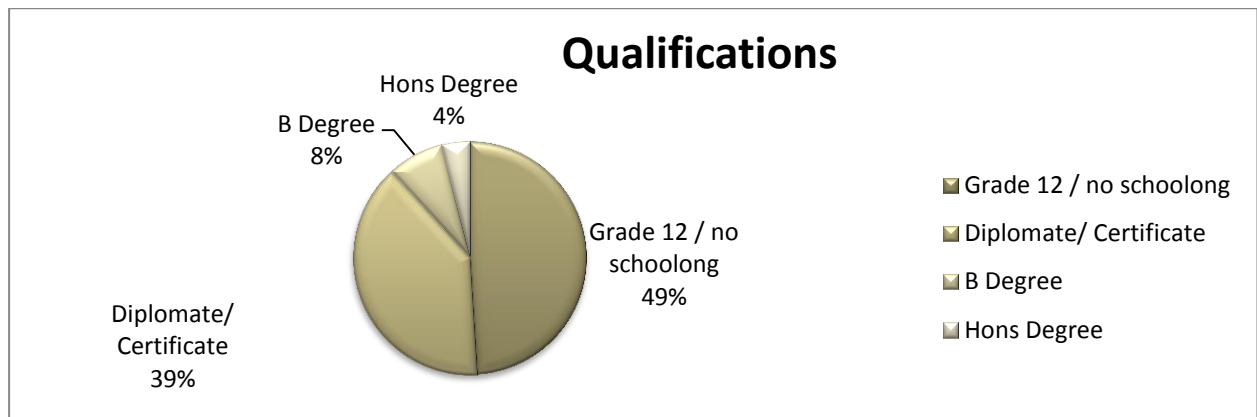
Figure 3.3: Race distribution



3.6.4 Qualifications

Figure 3.4 reveals that 49% of respondents have Grade 12 or no schooling at all and that 39% respondents have at least a Certificate or a Diploma. Respondents with a B Degree represents 8% of the respondents and 4% have an Honours degree.

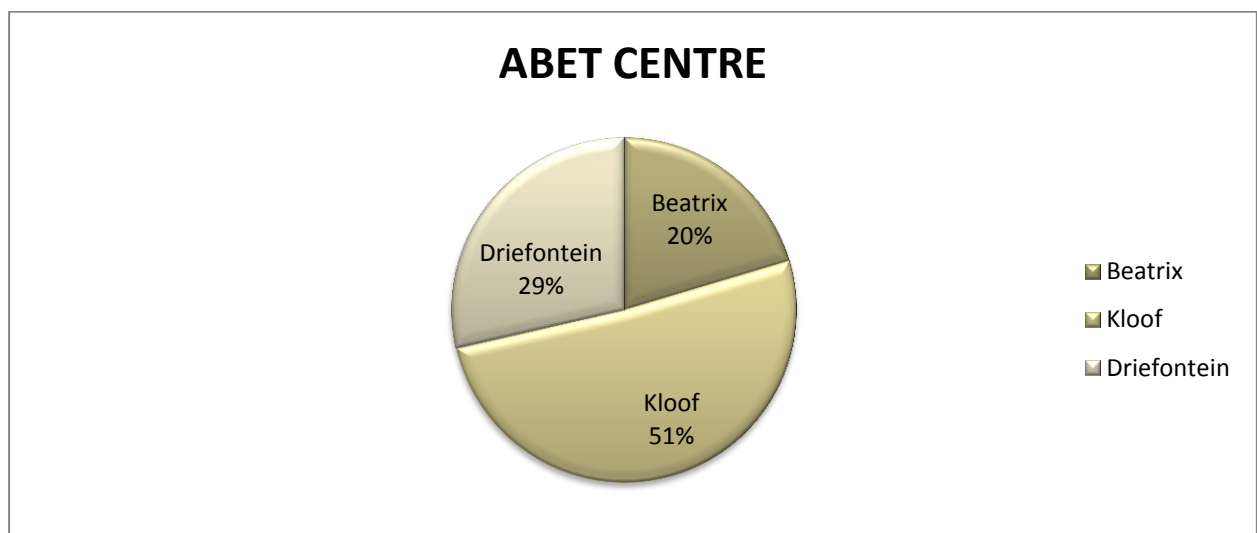
Figure 3. 4: Qualifications



3.6.5 ABET Centre

Figure 3.5 reveals that the majority of respondents were from the Kloof ABET centre (51%), with Driefontein 29% and 20% of the respondents were from the Beatrix Operations.

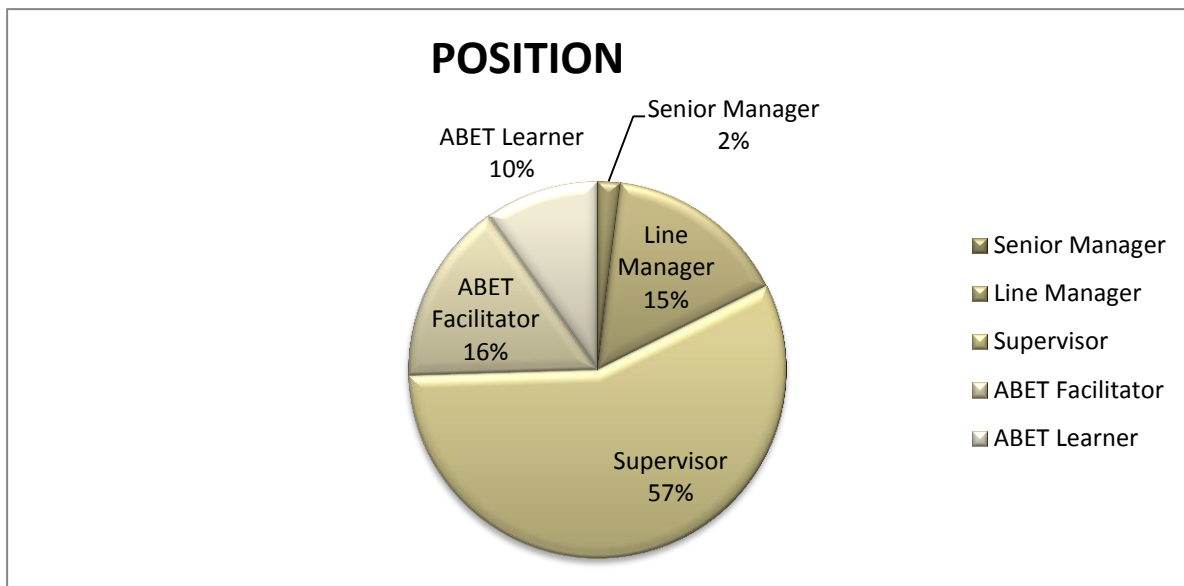
Figure 3 5: ABET centre



3.6.6 Position in the organisation

From figure 3.6 it is clear that the majority of the respondents represent the Supervisors (57%) that participated in the survey. The second largest group is the ABET Facilitators (16%) and ABET Learners (10%), while Senior Management represents 2% of the total respondents.

Figure 3.6: Position in the organisation



3.7 Empirical study: Results

The data that was collected for the purpose of the study were analysed using the SPSS software packages provided by the NWU Statistical Consultation Services. The statistical analysis included frequency analysis and descriptive statistics, reliability and internal consistency as well as correlations between construct by means of a Factor Analysis.

It is interesting to note that the researcher did not design the questionnaire to measure correlations between constructs and selected questions. However, the correlation results for all the questions indicated high correlations between certain questions which resulted in a Factor Analysis. The Factor Analysis spontaneously highlighted constructs and these were subsequently analysed, interpreted and discussed in the study.

The following basic descriptive statistics were used in the analysis namely:

- **The Mean**

The mean can be described as the most frequently used measurement to describe the central tendency of the data and is the extent to which all the data values group around a central value. The mean is calculated by summing the values of a variable for all the observations and then dividing it by the number of observations (Levine, *et al.*, 2008:97; Farmer, 2010:53).

- **The Variance**

The variance is calculated by means of finding the squared difference between an observation and the mean, obtaining the sum of all cases and then dividing them by the number of observations minus one. It also describes the average scatter of values around the mean, which in turn indicates the dispersion of the data (Levine, *et al.*, 2008:106; Farmer, 2010:53).

- **The Standard Deviation (SD)**

The standard deviation (SD) can be defined as the square root of the variance that in turn also describes the dispersion of data around the mean (Levine, *et al.*, 2008:107; Farmer, 2010:53).

When it comes to measuring the reliability of the questionnaire the most popular technique used is known as the **Cronbach alpha or coefficient alpha**. The Cronbach alpha is representative of the extent to which the statements are measuring the same underlying concept. Therefore it can be assumed that the greater the resulting Cronbach alpha coefficient, the more reliable the scale. This in turn means that if similar individual responses are observed for a set of statements, it could be concluded that the statements are measuring the same construct. It is important to note that, for items to be considered reliable, a value greater than 0.7 should be obtained (Farmer, 2010:53-54).

Another statistical method used was **correlation analysis**, which measures the extent to which changes in one variable are related to changes in another, and by so doing demonstrating the relation between two or more variables. Correlation coefficients can

range from -1, presenting a perfect negative correlation to +1, representing a perfect positive correlation (Levine, *et al.*, 2008:131; Farmer, 2010:54-56).

3.7.1 Frequency analysis and descriptive statistics

From the descriptive statistics in response to the statement “managing the influence of adult basic education and training on Occupational Health and Safety in the mining industry” as listed in Table 3.1, it can be observed that 17 (50%) from the 34 responses to the statements have a response greater than four, thus inferring a predisposition towards a strong positive accord with the primary statements. Thus, half of the statements scored a mean value greater than the neutral response of 3.00, indicating an inclination towards positive agreement. Q# 15 stating that “*every employee is responsible for their own safety*” scored the highest with a mean value of 4.74, with the lowest standard deviation of 0.48. Q# 26 stating that “*the reason for not achieving safety targets is because employees cannot read and write*” scored the lowest with a mean value of 2.56 and a standard deviation of 1.10, which could possibly indicate alternative internal and external factors that can also influence the achievement of safety targets.

Table 3. 1: Frequencies: Q7-Q34

Q#	Question	R	SD	D	N	A	SA	Missing	Mean	STD. DEV
7.	Because of ABET employees can read safety warnings in the workplace	57		2	7	31	17	0	4.11	0.74
8.	Because of ABET employees can read written safety instructions given to them by their Supervisors	57	0	0	7	34	16	0	4.16	0.62
9.	Because of ABET employees can communicate better in the workplace	56	0	0	8	35	13	1	4.09	0.61
10.	Sufficient time and effort is committed to safety in the organisation	55	0	5	5	24	21	2	4.11	0.91
11.	Management listens to safety ideas and concerns and take appropriate action	57	0	4	16	23	14	0	3.82	0.88
12.	I can read the safety information that is communicated to me on a regular basis should it not be understood	57	0	2	4	37	14	0	4.11	0.67
13.	Most employees are aware of potential hazards in their work environment and can read signs that indicate potential hazards	57	0	2	4	44	7	0	3.98	0.58

14.	Relevant safety information is communicated to me that I can read and understand	57	0	0	4	34	19	0	4.26	0.58
15.	Every employee is accountable for their own safety	57	0	0	1	13	43	0	4.74	0.48
16.	Employees receive adequate safety training	56	0	0	3	27	26	1	4.41	0.59
17.	Work instructions and procedures can be read and therefore implemented	57	0	2	5	33	17	0	4.14	0.71
18.	Employees should assist fellow workers by reading safety signs to them	57	0	4	8	24	21	0	4.09	0.89
19.	My supervisor /manager shows complete trust in my ability to identify risks because he / she assumes that I can read and write	57	0	1	6	29	21	0	4.23	0.70
20.	Safety is seen as a condition of employment	57	0	0	6	28	23	0	4.30	0.65
21.	Being rewarded for good safety performance helps to promote ABET as an opportunity to learn to read and write	57	1	3	12	28	13	0	3.86	0.89
22.	The majority of incidents and accidents are due to employees not being able to read and write	57	5	22	13	11	6	0	2.84	1.16
23.	Management cares about the safety and wellbeing of their employees	56	0	2	6	21	27	1	4.30	0.80
24.	Some people get away with unsafe acts because they cannot read or write	57	7	15	20	11	4	0	2.82	1.10
25.	Solutions for safety performance are most often short term and do not address the root cause	56	04	19	10	20	3	1	2.98	1.10
26.	The reason for not achieving safety targets is because employees cannot read or write	57	8	24	14	7	4	0	2.56	1.10
27.	The organisation keeps on getting the same accidents time and again	57	0	11	14	25	7	0	3.49	0.94
28.	Management has an open door policy when it comes to safety	57	0	1	6	35	15	0	4.12	0.65
29.	I am encouraged to make safety suggestions in writing	55	0	3	16	28	8	2	3.75	0.77
30.	ABET provides a culture of learning to ensure employees acquire skills and knowledge to ensure that they make a purposeful contribution to the social, economic and political arena in the country.	57	1	2	3	38	13	0	4.05	0.76
31.	ABET not only focus on literacy but also post- literacy and the education of adults to ensure they receive the necessary training and development for income generating purposes.	55	0	0	12	30	13	2	4.02	0.68
32.	A more realistic planning and provision of ABET is required to add to the understanding of ABET and to seek additional approaches to ABET as well as the inclusion of Occupational Health and Safety training	55	0	0	9	33	13	2	4.07	0.63

	as part of the ABET electives									
33.	ABET and formal education contributes to better Occupational Health and Safety figures?	54	1	3	6	33	11	3	3.93	0.84
34.	The lack of education amongst employees contributes to more accidents, incidents and fatalities in the mining industry?	55	3	7	13	24	8	2	3.49	1.06

Legend: R - Respondent; SD - Strongly disagree; D - Disagree; N -Neutral; A - Agree; SA - Strongly Agree

From the descriptive statistics in response to the statement “managing the influence of adult basic education and training on Occupational Health and Safety in the mining industry” as listed in Table 3.1 (Q 7–Q 34), the following can also be noted:

- 54.4 % of the respondents agreed that, because of ABET, employees can read safety warnings in the workplace and 59.6% of the respondents agreed that, because of ABET, employees can read written safety instructions given to them by their Supervisors. 62.5% agreed that, because of ABET, employees can communicate better in the workplace and 43.6% agreed that sufficient time and effort are committed to safety in the organisation;
- 40.4 % agreed that Management listens to safety ideas and concerns and take appropriate action and 64.9% agreed that they can read the safety information that is communicated to them on a regular basis, should it not be understood;
- 77.2% agreed that most employees are aware of potential hazards in their work environment and can read signs that indicate potential hazards and 59.6% agreed that relevant safety information is communicated to them that they can read and understand;
- 75.4% strongly agreed that every employee is accountable for their own safety and 48.2% agreed that employees receive adequate safety training;
- 57.9 agreed that work instructions and procedures can be read and therefore implemented and 42.1% agreed that employees should assist fellow workers by reading safety signs to them;
- 50.9 % agreed that their supervisor/manager shows complete trust in their ability to identify risks because he/she assumes that they can read and write and 49.1% regards safety as a condition of employment;

- 49.1% agreed that being rewarded for good safety performance helps to promote ABET as an opportunity to learn to read and write and 38.6% disagreed that the majority of incidents and accidents are due to employees not being able to read and write;
- 48.2% strongly agreed that Management cares about the safety and wellbeing of their employees and 35.1% were neutral to the assumption that some people get away with unsafe acts because they cannot read or write and 35.7% agreed that solutions for safety performance are most often short-term and do not address the root cause;
- 42.1% strongly disagreed that the reason for not achieving safety targets is because employees cannot read or write and 43.9% agreed that the organisation gets the same accidents time and again;
- 61.4 % agreed that Management has an open door policy when it comes to safety and 50.9% agreed that they are encouraged to make safety suggestions in writing;
- 66.7% agreed that ABET provides a culture of learning to ensure employees acquire skills and knowledge to ensure that they make a purposeful contribution to the social, economic and political arena in the country and 54.5% agreed that ABET not only focusses on literacy but also post-literacy and the education of adults to ensure they receive the necessary training and development for income generating purposes;
- 60% agreed that a more realistic planning and provision of ABET is required to add to the understanding of ABET and to seek additional approaches to ABET as well as the inclusion of Occupational Health and Safety training as part of the ABET electives and 61% agreed that ABET and formal education contribute to better Occupational Health and Safety figures; and
- 43.6% agreed that the lack of education amongst employees contributes to more accidents, incidents and fatalities in the mining industry.

From the descriptive statistics in response to the statement “managing the influence of adult basic education and training on Occupational Health and Safety in the mining industry” as listed in Table 3. 2 (Q# 35-50), the following can be noted:

Table 3. 2: Frequencies: Q35-Q50

Q#	Question	R	Y	N	DN	Missing	Mean	STD. Dev
35.	Does ABET assist in demonstrating an understanding of how to participate effectively in the workplace	56	38	6	12	1	1.54	0.83
36	Does ABET assist in identifying security, safety and environmental risks in the work place?	55	37	8	10	2	1.51	0.79
37	Does ABET assist employees to engage in a range of speaking / signing and listening interactions for OHS (Occupational Health and Safety) purposes in the work place?	56	50	3	3	1	1.16	0.49
38	Does ABET prepare employees to perform basic life support and first aid procedures?	56	29	16	11	1	1.68	0.78
39	Does ABET contribute to better OHS (Occupational Health and Safety) in the workplace?	56	36	6	14	1	1.61	0.86
40	Does ABET assist with reading and writing skills of workers to enable them to identify Health and Safety signs, instructions and communication?	57	55	2	0	0	1.04	0.18
41	Are workers more able to understand Health and Safety instructions in the workplace because of ABET?	57	51	3	3	0	1.16	0.49
42	Are workers more able to take on new Health and Safety tasks because of ABET?	57	41	7	9	0	1.44	0.75
43.	Is there a connection between pre - ABET and post ABET and enhanced OHS (Occupational Health and Safety) in the workplace?	56	34	5	17	1	1.70	0.91
44	Is poor OHS (Occupational Health and Safety) related to a lack of reading and writing skills of employees in the workplace?	56	27	22	7	1	1.64	0.69
45	Employees will spend more time to complete a job safely rather than rushing to finish the job?	57	26	23	8	0	1.68	0.71
46	Safety is driven by management and not the employees because they cannot read or write?	57	9	42	6	0	1.95	0.51
47	Literacy will lead to good safety performance and good business performance?	56	47	2	7	1	1.29	0.68
48	Some people get away with unsafe acts because they cannot read or write?	57	16	31	10	0	1.89	0.67
49	According to the White Paper on Education (1995) all persons, children, youth and adults have a right to basic education. Were you aware of this?	57	48	6	2	0	1.18	0.47
50	Do you think that not taking annual leave contributes	57	40	12	4	0	1.36	0.61

	to more accidents incidents and fatalities in the Mining Industry?							
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Legend: R - Respondent; Y -Yes; N – No; DN –Don't know

From the descriptive statistics in response to the statement “managing the influence of adult basic education and training on Occupational Health and Safety in the mining industry”, as listed in Table 3.2, it can be observed that, from the sixteen responses to the statements, the mean of nine responses are greater than 1.5, thus also inferring a predisposition towards a strong positive accord with the primary objective. Therefor more than half of the statements scored a mean value greater than the **no** response, indicating an inclination towards positive agreement.

Q# 46 stating that *safety is driven by management and not the employees because they cannot read or write*, with a mean value of 1.95 and a standard deviation of 0.51. Note that nine respondents marked option 1 (yes), 42 respondents option 2 (no) and six respondents option 3 (don't know).

Q# 40 stating that *Does ABET assist with reading and writing skills of workers to enable them to identify Health and Safety signs, instructions and communication* is scored the lowest, with a mean value of 1.04 and a standard deviation of 0.18. Note that 55 respondents marked option 1 (yes) and 2 respondents option 2 (no) and nil respondents option 3 (don't know).

From the descriptive statistics in response to the statement “managing the influence of adult basic education and training on Occupational Health and Safety in the mining industry”, as listed in Table 3.2, the following can also be noted:

- 67.9% answered yes to the question, *if ABET assist in demonstrating an understanding of how to participate effectively in the workplace* and 67.3% answered yes to the question *if ABET assist in identifying security, safety and environmental risks in the work place*;
- 87.7% answered yes to the question, *if ABET assist employees to engage in a range of speaking, signing and listening interactions for OHS (Occupational Health and Safety) purposes in the work place*, and 50.9% answered yes to the

question *if ABET prepares employees to perform basic life support and first aid procedures*;

- 63.2% answered yes to the question *“Does ABET contributes to better OHS (Occupational Health and Safety) in the workplace?”* And 96.5% answered yes to the question *“Does ABET assist with reading and writing skills of workers to enable them to identify Health and Safety signs, instructions and communication?”*;
- 89.5% answered yes to the question *“are workers more able to understand Health and Safety instructions in the workplace because of ABET?”* and 71.9% answered yes to the question *“are workers more able to take on new Health and Safety tasks because of ABET?”*;
- 59.6% answered yes to the question *“if there is there is a connection between pre - ABET and post ABET and enhanced OHS (Occupational Health and Safety) in the workplace?”* and 47.4% answered yes to the question *“if poor OHS (Occupational Health and Safety) related to a lack of reading and writing skills of employees in the workplace?”*;
- 45.6% of respondents answered yes to the question *“if employees will spend more time to complete a job safely rather than rushing to finish the job”* and 73.3% answered no to the question *“if safety is driven by management and not the employees because they cannot read or write?”*;
- 82.5 % of respondents answered yes to the question if *“literacy will lead to good safety performance and good business performance”* and 54.4% answered no the question *“if some people get away with unsafe acts because they cannot read or write?”*;
- 84.2% of respondents answered yes to the following question *“according to the White Paper on Education (1995) all persons, children, youth and adults have a right to basic education. Were you aware of this”* and 70.2% of respondents answered yes to the question *“Do you think that not taking annual leave contributes to more accidents incidents and fatalities in the Mining Industry”*; and
- Of the sixteen questions asked 12 questions received a percentage score above 50% with the highest score 96.5% and the lowest 15.8% for the yes answer. That indicates a predisposition towards a strong positive accord with the primary statements.

3.8 Reliability and internal consistency

Cronbach's alpha is a statistical measurement tool designed to test reliability and internal consistency. It also indicates if items and subsections of items in the measuring instrument are highly correlated. Cronbach's alpha (α) is consequently a coefficient of reliability of items in a survey instrument that focusses mainly on the quality of the measurement.

An example that can be used is a questionnaire that produces different scores each time it is used and is subjected to the same conditions. This will subsequently lead to a low coefficient of reliability.

A value of >0.7 is acceptable.

A value of > 0.8 is good (Botha, 2012:53). The following formula can be used to calculate Cronbach's alpha:

Equation 3. 2: Cronbach's alpha coefficient

$$\alpha = \frac{k}{k-1} \left[1 - \frac{\sum_{i=1}^k Q_{y_i}^2}{\sigma_x^2} \right]$$

Where:

α = Cronbach's alpha coefficient

k = number of items in the construct

$Q_{y_i}^2$ = variance of item, i , where $i = 1$ to k

σ_x^2 = variance of the observed total item scores

To establish the Cronbach's alphas for the study, individual questions were analysed.

Table 3. 3: Cronbach's alpha values

Q#	Cronbach's Alpha
Q7 – Q34	0.86

The results obtained from the reliability analysis for the 28 items (Q7- Q34) yielded a Cronbach alpha coefficient of 0.86, indicating a good reliability.

As seen in Table 3.3, 24 of the 28 statements revealed a mean response greater than 3.00, therefore suggesting a positive inclination towards the influence of adult basic education and training on Occupational Health and Safety in the mining industry.

Item 15 stating that, “*Every employee is accountable for their own safety*” scored the highest with a mean value of 4.78, with the lowest standard deviation of 0.422.

Item 26 stating that “*the reason for not achieving safety targets is because employees cannot read and write*” scored the lowest, with a mean value of 2.53 and a standard deviation of 1.10.

3.9 Correlations

The following regarding the Spearman's rho (ρ) correlation can be noted:

- Spearman's rho (ρ) correlation, also referred to as the Spearman's rank correlation coefficient can be seen as a nonparametric equivalent of the Pearson correlation;
- The Spearman's rho (ρ) is a statistical technique that measures the linear correlation between two variables; and
- Should a negative correlation between two questions or items exists, it would in all practical terms imply that as the one items cored higher, the other one scored lower (Welman, *et al.*, 2010:234; Botha, 2012:56).

Table 3. 4: Spearman's rhos and p-values for selected questions

	Q7	Q8	Q9	Q 10	Q 11	Q 12	Q 13	Q 14	Q 15	Q 16	Q 17	Q 18	Q 19	Q 20	Q 21	Q 22	Q 23	Q 24	Q 25	Q 26	Q 27	Q 28	Q 29	Q 30	Q 31	Q 32	Q 33	Q 34
Q 7 Correla tion Coeffici ent Sig. (2- tailed N	1.00 0 57	702. .. 000. 57	472. .. 000 56	150 . 275 55	127 . 347 57	153 . 255 57	071 . 598 57	179 . 182 57	009 . 944 57	073 . 590 56	126 . 352 57	307 . 020 57	247 . 064 57	081 . 551 57	348 .. 008 57	299 .. 024 57	006 . 964 56	290 .. 028 57	309 .. 021 56	188 . 162 57	267 .. 045 57	013 . 925 57	234 . 085 55	299 .. 024 57	377 .. 005 55	156 . 256 55	377 .. 005 54	139 . 311 55
Q 8 Correla tion Coeffici ent Sig. (2- tailed N	702. .. 000. 57	1.00 0 57	558 .. 000 56	106 . 443 55	160 . 234 57	222 . 097 57	074 . 585 57	405 .. 002 57	096 . 477 57	047 . 728 56	176 . 190 57	125 . 353 57	166 . 216 57	027 . 843 57	221 . 098 57	212 . 114 57	091 . 505 56	151 . 263 57	353 .. 008 56	074 . 583 57	385 .. 003 57	004 . 975 57	220 . 107 55	314 . 017 57	415 .. 002 55	081 . 558 55	086 . 536 54	276 . 041 55
Q 9 Correla tion Coeffici ent Sig. (2- tailed N	472. .. 000. 56	558. .. 000. 56	1.0 00 56	134 . 329 55	197 . 147 56	192 . 157 56	058 . 672 56	162 . 233 56	230 . 089 56	013 . 923 55	067 . 623 56	288 .. 031 56	102 . 453 56	001 . 992 56	268 .. 046 56	292 .. 029 56	153 . 261 56	294 .. 028 56	212 . 120 55	140 . 302 56	274 .. 041 56	027 . 842 56	276 .. 044 54	307 .. 021 56	377 .. 005 54	088 . 527 54	289 .. 036 53	331 .. 015 54
Q 10 Correla tion Coeffici ent Sig. (2- tailed N	150. 275. 55	106. 443. 55	134 329 55	1.0 00 55	757 .. 000 55	259 . 057 55	287 .. 034 55	178 . 194 55	119 . 386 55	227 . 099 54	074 . 594 55	172 . 209 55	012 . 931 55	139 . 311 55	167 . 224 55	014 . 922 55	326 .. 015 55	139 . 313 55	091 . 512 54	038 . 782 55	087 . 526 55	049 . 721 55	217 . 118 53	392 .. 003 55	111 . 428 53	009 . 949 53	268 . 055 52	185 . 185 53
Q 11 Correla tion Coeffici ent Sig. (2- tailed N	127. 347. 57	160. 234. 57	197 147 56	757 .. 000 55	1.0 00 57	451 .. 000 57	364 .. 005 57	229 . 087 57	213 . 112 57	305 .. 022 56	061 . 654 57	251 . 059 57	110 . 417 57	051 . 709 57	054 . 688 57	021 . 874 57	457 .. 000 56	205 . 127 57	057 . 679 56	038 . 781 57	035 . 794 57	262 .. 049 57	243 . 074 55	446 .. 001 57	282 .. 037 55	097 . 482 55	200 . 148 54	072 . 603 55
Q 12 Correla tion	153. 222. 192	222. 222. 192	192 259 451	259 . 451 00	451 . 00 124	00 . 124 459	124 . 459 291	459 . 291 340	291 . 340 234	340 . 234 305	234 . 305 302	305 . 302 075	302 . 075 239	075 . 239 075	239 . 075 239	075 . 239 075	316 . 161 271	161 . 271 189	271 . 189 224	189 . 224 288	224 . 288 352	288 . 352 189	352 . 189 229	189 . 229 048	229 . 048 010	048 . 010 010	010 . 010 010	

[illegible]

Q 1 8	Correla tion Coeffici ent Sig. (2- tailed N	307. 020. 57	125. 353. 57	288. 031 56	172 209 55	251 059 57	305 021 57	029 833 57	118 381 57	416 001 57	352 008 56	159 239 57	1.0 00 57	418 001 57	351 007 57	151 263 57	126 352 57	214 113 56	077 571 57	008 955 56	001 992 57	216 107 57	253 058 57	412 002 55	362 006 57	300 026 55	482 000 55	366 007 54	026 848 55
Q 1 9	Correla tion Coeffici ent Sig. (2- tailed N	247. 064. 57	166. 216. 57	102 453 56	012 931 55	110 417 57	302 022 57	069 611 57	330 012 57	113 401 57	194 152 56	156 245 57	418 001 57	1.0 00 57	401 002 57	053 698 57	165 219 57	236 080 56	270 043 57	085 534 56	081 548 57	140 298 57	279 036 57	349 009 55	323 014 57	320 017 55	296 028 55	475 000 54	237 082 55
Q 2 0	Correla tion Coeffici ent Sig. (2- tailed N	081. 551. 57	027. 843. 57	001 992 56	139 311 55	051 709 57	075 578 57	177 187 57	128 342 57	171 202 57	179 188 56	278 036 57	351 007 57	401 002 57	1.0 00 57	259 051 57	199 139 57	187 168 56	253 057 57	040 770 56	237 076 57	123 363 57	296 025 57	306 023 55	415 001 57	354 008 55	435 001 55	273 046 54	171 213 55
Q 2 1	Correla tion Coeffici ent Sig. (2- tailed N	348. 008. 57	221. 098. 57	268 046 56	167 224 55	054 688 57	239 073 57	163 227 57	054 691 57	139 302 57	139 308 56	500 000 57	151 263 57	053 698 57	259 051 57	1.0 00 57	233 082 57	077 570 56	493 000 57	207 125 56	274 039 57	011 934 57	160 234 57	200 143 55	336 011 57	380 004 55	307 023 55	255 063 54	007 958 55
Q 2 2	Correla tion Coeffici ent Sig. (2- tailed N	299. 024. 57	212. 114. 57	292 029 56	014 922 55	021 874 57	006 967 57	128 341 57	072 595 57	036 790 57	191 158 56	212 114 57	126 352 57	165 219 57	199 139 57	233 082 57	1.0 00 57	075 585 56	450 000 57	295 027 56	646 000 57	122 365 57	141 295 57	348 009 55	189 158 57	319 018 55	162 237 55	364 007 54	695 000 55
Q 2 3	Correla tion Coeffici ent Sig. (2- tailed N	006. 964. 57	091. 505. 57	153 261 56	326 015 55	457 000 57	316 017 57	246 067 57	309 020 57	344 009 57	657 000 56	367 005 57	214 113 57	236 080 57	187 168 57	077 570 57	075 585 57	1.0 00 57	036 791 57	215 114 57	060 661 57	102 455 57	457 000 57	508 000 57	354 007 57	130 350 55	011 935 55	266 054 54	082 555 55

	N	56	56	56	55	56	56	56	56	55	56	56	56	56	56	56	56	56	55	56	56	56	54	56	54	54	53	54	
Q 2 4	Correla tion Coeffici ent	290.	151.	294.	139	205	161	184	105	033	021	367.	077	270.	253	493.	450.	036	1.0 00	356.	555.	061	176	195	213	345.	192	274	329.
	Sig. (2- tailed	028.	263.	028	313	127	233	171	438	805	875	005	571	043	057	000	000	791		007	000	650	191	155	112	010	160	045	014
	N	57	57	56	55	57	57	57	57	57	56	57	57	57	57	57	56	57	56	57	57	57	55	57	55	55	54	55	
Q 2 5	Correla tion Coeffici ent	309.	353.	212	091	057	271.	090	294.	285.	164	072	008	085	040	207	295.	215	356.	1.0 00	337.	390.	090	012	260	387.	311	238	288
	Sig. (2- tailed	021.	008.	120	512	679	043	509	028	033	233	597	955	534	770	125	027	114	007		011	003	508	933	053	004	022	086	035
	N	56	56	55	54	56	56	56	56	56	55	56	56	56	56	56	56	55	56	56	56	56	56	54	56	54	54	53	54
Q 2 6	Correla tion Coeffici ent	188.	074.	140	038	038	022	183	126	018	024	093	001	081	237	274.	646.	060	555.	337.	1.0 00	220	179	222	076	234	128	271.	477.
	Sig. (2- tailed	162.	583.	302	782	781	872	172	351	891	863	492	992	548	076	039	000	661	000	011		100	182	104	572	085	353	048	000
	N	57	57	56	55	57	57	57	57	57	56	57	57	57	57	57	57	56	57	56	57	57	57	55	57	55	55	54	55
Q 2 7	Correla tion Coeffici ent	267.	385.	274.	087	035	189	145	435.	202	260	107	216	140	123	011	122	102	061	390.	220	1.0 00	087	294.	227	350.	362.	145	334.
	Sig. (2- tailed	045.	003.	041	526	794	159	283	001	131	053	429	107	298	363	934	365	455	650	003	100		519	029	089	009	007	296	013
	N	57	57	56	55	57	57	57	57	57	56	57	57	57	57	57	57	56	57	56	57	57	57	55	57	55	55	54	55
Q 2 8	Correla tion Coeffici ent	013.	004.	027	049	262.	224	254	141	215	401.	400.	253	279.	296.	160	141	457.	176	090	179	087	1.0 00	398.	285.	163	127	112	104
	Sig. (2- tailed	925.	975.	842	721	049	093	056	295	109	002	002	058	036	025	234	295	000	191	508	182	519		003	032	233	357	418	450
	N	57	57	56	55	57	57	57	57	57	56	57	57	57	57	57	57	56	57	56	57	57	57	55	57	55	55	54	55
Q 2 9	Correla tion Coeffici ent	234.	220.	276.	217	243	288.	158	315	304.	468.	326.	412.	349.	306.	200	348.	508.	195	012	222	294.	398.	1.0 00	442.	344	247	261	411.
	Sig. (2- tailed	085.	107.	044	118	074	033	249	019	024	000	015	002	009	023	143	009	000	155	933	104	029	003		001	012	075	062	002

	N	55	55	54	53	55	55	55	55	55	55	55	55	55	55	55	54	55	54	55	55	55	55	55	53	53	52	53	
Q30	Correlation Coefficient	299.	314.	307	392	446	352	335	447	280	213	220	362	323	415	336	189	354	213	260	076	227	285	442	1.000	653	292	300	160
	Sig. (2-tailed)	024.	017.	021	003	001	007	011	000	035	115	099	006	014	001	011	158	007	112	053	572	089	032	001		000	030	027	244
	N	57	57	56	55	57	57	57	57	57	56	57	57	57	57	57	57	56	57	56	57	57	57	55	57	55	55	54	55
Q31	Correlation Coefficient	377.	415.	377		282		408	327				300	320	354	380	319		345	387		350		344	653	1.000	343	353	260
	Sig. (2-tailed)	005.	002.	005	428	037	168	002	015	261	984	088	026	017	008	004	018	350	010	004	085	009	233	012	000		010	009	055
	N	55	55	54	53	55	55	55	55	55	54	55	55	55	55	55	55	54	55	54	55	55	55	53	55	55	55	54	55
Q32	Correlation Coefficient												298	482	296	435	307					362			292	343	1.000	406	159
	Sig. (2-tailed)	256.	558.	527	949	482	092	148	841	601	963	027	000	028	001	023	237	935	160	022	353	007	357	075	030	010		002	246
	N	55	55	54	53	55	55	55	55	55	54	55	55	55	55	55	55	54	55	54	55	55	55	53	55	55	55	54	55
Q33	Correlation Coefficient	377.		289																					300	353	406	1.000	422
	Sig. (2-tailed)	005.	536.	036	055	148	731	272	829	737	128	764	007	000	046	063	007	054	045	086	048	296	418	062	027	009	002		001
	N	54	54	53	52	54	54	54	54	54	53	54	54	54	54	54	54	53	54	53	54	54	54	52	54	54	54	54	54
Q34	Correlation Coefficient	139.	276.	331														695		329	288	477	334		411			422	1.000
	Sig. (2-tailed)	311.	041.	015	185	603	939	720	590	873	441	981	848	082	213	958	000	555	014	035	000	013	450	002	244	055	246	001	
	N	55	55	54	53	55	55	55	55	55	54	55	55	55	55	55	55	54	55	54	55	55	55	53	55	55	55	54	55

The following regarding the Spearman's rho (ρ) correlation as listed in Table 3.4 it can be noted in that the researcher would again like to indicate that she did not design the questionnaire to measure correlations between constructs and selected questions. However, the correlation results for all the questions indicated high correlations between certain questions which resulted in a factor analysis.

As listed in Table 3.4 **. Correlation is significant at the 0.01 level (2-tailed) and *. Correlation is significant at the 0.05 level (2-tailed).

3.10 Factor Analysis

Factor analysis can be described as a technique for identifying specific groups of variables. A factor analysis has three main functionalities, firstly to be able to comprehend the structure of a set of variables. Secondly to assist with the design of a questionnaire to measure certain principal variables and lastly the reduction of the data set in order to better manage the data as well as keeping as much as possible of the original information (Field, 2009:628). As seen in Figure 3.7 the Scree plot indicates the eigenvalues according to the relative importance of each factor. For the purpose of the study seven factors were used by means of using the point of inflexion in the curve as the cut-off point (Field, 2009:639-642).

Figure 3. 7: Scree Plot

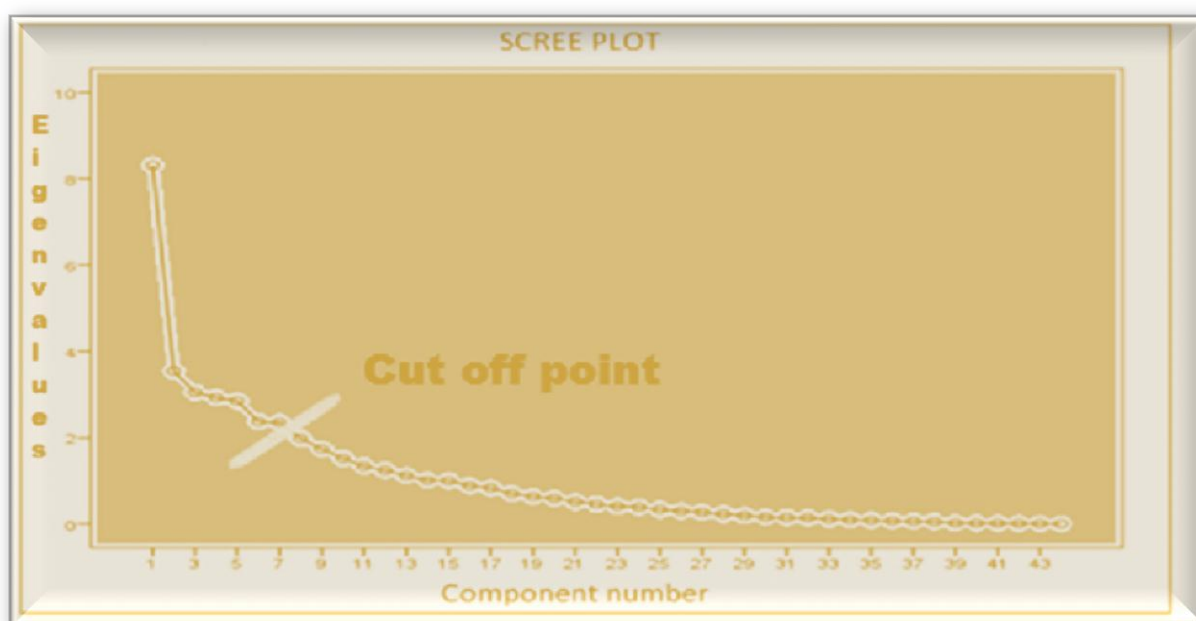


Table 3. 5: Structure Matrix

Structure Matrix														
	Component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Q22	.883													
Q26	.827													
Q34	.731									-.352				.316
Q24	.589		.421					.379		-.386		-.348		
Q44	-.554				.406				-.341	.356			.342	
Q25	.536	.333		-.461					-.339					
Q16		-.797				-.302								
Q15		-.780												
Q29		-.664						.342				-.354		
Q23		-.625				-.459					-.393			
Q40			-.799			.392								
Q21			.788					.307						
Q30		-.325	.563						-.326	-.341			-.434	
Q12			.540	-.316						-.354				-.453
Q14		-.316		-.833		-.339								
Q48				.792										
Q27				-.591	-.329		-.368		-.306		.357			
Q47					.698		.357							
Q46					.691				.303					
Q28		-.348			-.682									
Q42						.864								
Q41			-.415			.619								-.472
Q43				.359	.392	.484	.431				-.329			
Q38							.851							
Q39				.487		.470	.581	-.311		.325				
Q13								.843						
Q17			.333		-.322			.765						
Q45	-.332		-.389					-.604						-.461
Q35							.334	-.507		.375		.346		-.443
Q8				-.389					-.775					
Q9									-.719			-.304		
Q31	.429			-.341				.440	-.529			-.301	-.355	
Q10										-.874				
Q11										-.858				
Q36				.332			.530			.590				
Q49					.410						.666		.489	
Q20								.336			.633	-.384		.370
Q32					-.483	.318					.505	-.373		
Q19												-.824		
Q18		-.397										-.766		
Q7			.317						-.485			-.702		
Q33	.529									-.331		-.621		.416
Q50													.896	
Q37							.307							-.836

The values in Table 3.6–3.12 labelled *Cronbach's Alpha if Item Deleted* can be regarded as the values of the overall α should that item not be included in the calculation and thus reflect the change in the *Cronbach's Alpha* should an item be deleted.

Table 3. 6: Scale factor 1

Item-Total Statistics					
Illiteracy effects	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q24	15.70	14.638	.552	.364	
Q25	15.58	15.824	.396	.178	
Q22	15.68	13.145	.712	.612	.738
Q26	15.98	13.673	.698	.544	.743
Q33	14.58	16.555	.457	.227	
Q34	15.02	14.673	.581	.472	.771
Mean					2.252

Table 3.6 indicates that Illiteracy effects (C1) displays a good reliability ($\alpha = 2.25$) and indicates that Illiteracy leads to mine related incidents, accidents, fatalities, loss of production, and unacceptable safety performances.

Table 3. 7: Scale factor 2

Item-Total Statistics					
Ownership	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q15	19.62	5.355	.200	.205	.504
Q16	20.00	4.192	.546	.490	.355
Q23	20.11	3.795	.472	.502	.352
Q25	21.47	5.408	-.145	.124	
Q28	20.23	4.448	.444	.250	
Q29	20.64	3.773	.507	.292	.334
Mean					1.545

Table 3.7 reveals that Ownership (C2) consists of four questions and also displays a low reliability ($\alpha = 1.54$) and indicates that Ownership of safety performances lies with the Company and employees and is a factor that needs attention.

Table 3. 8: Scale factor 3

Item-Total Statistics					
H & S Management	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q10	7.87	1.891	.658	.538	.600
Q11	8.15	1.941	.719	.567	.526
Q30	7.95	2.719	.425	.191	
Mean					1.126

Table 3.8 reveal that H&S Management (C3) consists of two questions and also displays a low reliability ($\alpha = 1.12$) and indicates that effective H&S planning is required that can contribute to the reduction of incidents, accidents and fatalities and ensure the transfer of ownership of safety performances and positive behaviours to the employee.

Table 3. 9: Scale factor 4

Item-Total Statistics					
Communication	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q12	18.58	6.132	.331	.280	.496
Q14	18.43	6.097	.417	.315	.473
Q25	19.75	4.535	.415	.201	
Q27	19.23	5.563	.292	.191	
Q30	18.64	5.734	.346	.248	
Q33	18.75	6.650	.061	.127	
Mean					0.970

Table 3.9 reveals that Communication (C4) consists of two questions and displays a low reliability ($\alpha = 0.97$) and that ABET contributes to literate employees that can read and understand safety instructions.

Table 3. 10: Scale factor 5

Item-Total Statistics					
Literacy	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q7	19.13	6.780	.363	.200	.571
Q17	19.04	7.443	.240	.179	.612
Q19	18.95	6.941	.381	.209	.568
Q20	18.87	7.298	.328	.142	
Q24	20.38	4.685	.585	.371	
Q34	19.73	6.165	.275	.169	
Mean					1.751

Table 3.10 reveals that Literacy (C5) consists of three questions and displays a reliability ($\alpha = 1.75$) and that ABET and formal education contributes better safety performances and practices.

Table 3. 11: Scale factor 6

Item-Total Statistics					
ABET effects	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q7	16.63	4.502	.469	.264	.655
Q18	16.59	3.982	.532	.295	
Q19	16.44	4.553	.532	.288	
Q20	16.37	5.332	.297	.120	
Q33	16.78	4.138	.496	.271	.644
Mean					1.299

Table 3.11 shows that ABET effects (C6) consists of two questions and displays a reliability ($\alpha = 1.29$) and reveals that, due to ABET work related instructions can be executed and employees can read warning signs that indicate potential hazards.

Table 3. 12: Scale factor 7

Item-Total Statistics					
Comprehension	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q13	8.44	1.215	.346	.132	.448
Q17	8.28	.920	.408	.171	.334
Q20	8.12	1.145	.304	.095	
Mean					.781

Table 3.12 indicates that Comprehension (C7) consists of two questions and displays a low reliability ($\alpha = 0.78$) and that ABET not only contributes to literacy but also to the further training and development of employees.

Table 3. 13: Cronbach's alpha if Item Deleted - values for selected constructs

C#	Construct	Questions	Cronbach's alpha
C1:	Illiteracy effects	Q24 Q22 Q26	2.252
C2:	Ownership	Q15 Q16 Q23 Q29	1.545
C3:	H & S Management	Q10 Q11	1.126
C4:	Communication	Q12 Q14 Q27	0.970
C5:	Literacy	Q7 Q17 Q19	1.751

C6:	ABET effects	Q33	1.299
C7:	Comprehension	Q13 Q17	0.781
Overall α			9.724

The values in the column labelled *Cronbach's Alpha if Item is deleted* (please see Table 3.13) can be seen as the values for the overall α given that an item or items are not included in the calculation. An overall α of 9.724 indicates that all items are positively contributing to the overall reliability. It can also be regarded as excellent and indicates by all means good reliability (Field, 2009:678–679).

3.11 Qualitative analysis

The researcher used unstructured questions or open questions where respondents had to articulate their responses spontaneously. Questions 51-55 were open-ended questions with the objective to reflect subjective comments. The comments were analysed in a qualitative style as listed in Table 3.14, with the purpose to add value to the results obtained from the quantitative research.

The open-ended questions analysed the secondary objectives qualitatively and were based on five themes, namely:

- The **broader impact and influence** of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the Mining industry;
- The **impact and influence** of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the Mining industry;
- Typical **outcomes** of Adult Basic Education and Training (ABET) in the Mining Industry;
- **Distinction** between pre - Adult Basic Education and Training (ABET) and Post-Adult Basic Education and Training (ABET) employees; and
- **Correlation and relationship** between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) awareness in the Mining Industry.

Table 3.14: Comments on questions 51-55

Question 51: Briefly describe the broader impact of ABET on the Health and Safety performance in your organisation	The following broader impacts were alluded to and common themes noted namely:
	• ABET improves safety in the workplace. • ABET helps learners to read and understand safety instructions and Company Briefs and also make employees aware of health issue, for example HIV and aids. • Communication improves safety in the workplace. • Development of employees in the organisation will lead to commitment to health and safety. • ABET helps to eliminate illiteracy levels. • ABET assists in identifying risks in the workplace. • Motivates employees and give them self-respect. • ABET provides employees with the tools to understand their jobs and the risks associated with it. • Employees are keen to read information on noticeboards that are linked to health and safety issues and in the process become more vigilant. • Helps employees to understand Company communication regarding

	accidents, incidents and fatalities and their reasons for occurring. • ABET has an impact on the future of the mining industry. • There is a direct correlation between literacy and safety. The higher the literacy levels the better employees are able to interpret and understand safety requirements, and therefore contribute to improved compliance and responses to risk.
Question 52: What do you think is the impact and influence of ABET on Occupational Health and Safety in the mining industry	Impacts and influences that were highlighted:
	• Understanding of health issues and diseases and the effects thereof. • ABET opens the door to learning and development and improves cognitive ability that in turn increases ability and awareness towards safety, thus has a direct effect on safety performance. • Assist to understand safety better. • Being able to read and write is a motivational factor to apply safety requirements in the workplace. • It uplifts the employees to better themselves and emphasises that communication is a key issue in safety. • Developing employees in the mining industry

	will lead to a greater understanding of what health and safety is. • Better OHS practices in the workplace. • ABET plays a role in helping employees understand that they are responsible for their own safety. • Improves communication with management. • It will assist in improving OHS, but mind sets will have to change towards OHS. • ABET can add significantly to OHS, if it can be added as an elective to the ABET curriculum. • ABET has given employees the know-how to participate in safety activities. • Employees will know how to calculate and assess risk. • ABET influences peoples' behaviour towards OHS.
Question 53: What do you think is the relationship between ABET and Occupational Health and Safety in the Mining Industry?	The following regarding the relationship between ABET and Occupational Health and Safety were noted:
	• The higher the percentage of employees that participated in ABET the greater the potential for safety understanding and procedural compliance and until such time as illiteracy is eradicated, the relationship between ABET and OHS will remain a

	necessity. • ABET develops an individual to a point where communication and understanding between employees lead to a better working environment. • Once mind-sets towards OHS have changed, the relationship between ABET and OHS should improve. • ABET improves the self-esteem of learners and create a desire to read and write. • Due to the quality of ABET training, employees develop a desire to read OHS briefs and other communication from management. • ABET and OHS are interlinked and committed to deliver and implement safer processes in order to eliminate incidents and accidents. • ABET helps to promote a better relationship between workers and management. • ABET supports and contributes to the process of understanding OHS and the implementation thereof in the mining industry.
Question 54: What do you think are the typical outcomes of ABET in the Mining Industry?	The following outcomes were also identified:

	• A literate and motivated work force. • Assists employees to better themselves. • Improved communication between workers and management. • Better health and safety performance. • Self-improvement through education. • Assists employees to identify hazards in the workplace. • Better job opportunities that lead to a better lifestyle. • Speaking, reading, listening, writing and mathematical literacy at foundational level. • ABET leve1–4 increase moral and improve learners' self-esteem and reduces absenteeism and also contribute to improved English proficiency and numeracy. • Safes lives in the Mining Industry and prevents accidents. • Improves the levels of education of workers and people staying in the surrounding communities. • Employees are able to do their budgets and financial planning. • To prepare employees for mining learnerships. • Reduction of the use of Fanakalo in the mining industry. • Positive behaviour.
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Question 55: What do you think is the difference between pre-ABET and post- ABET?	Respondents indicated the following difference between pre-ABET and post-ABET:
	• Pre-ABET safety performance is reliant on enforced Supervisory efforts to drive outcomes, while post-ABET has the potential to move accountability for performance to a self-driven culture. • The difference between pre-and post-ABET is that pre-ABET introduces a culture of learning and provides the foundation for acquiring knowledge and skills and post-ABET provides employees with the opportunity and ability to further their studies. • The degree of literacy. Before ABET, awareness levels were low but after completing ABET the leaners are more aware of learning opportunities available to them. • In the pre-ABET phase, levels of understanding of OHS are limited and in the post-ABET phase there is a significant improvement. • Pre-ABET can be seen as a language barrier that contributed to mistrust and conflict and post-ABET contributes to a better equipped individual and employee. • Pre- and post-ABET can be seen as a shift from the unknown to the known in terms of education and personal growth.

	Pre-ABET: Lack of confidence, distrust and ignorance. Post-ABET: Confident, trustful, informed employees with a willingness to learn with a more positive attitude. • Pre-ABET is relying on people telling workers what they should be doing and what not. Post-ABET contributes to reading skills and understanding why they should comply with procedures and instructions.
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3.12 Conclusion

In this chapter, the results emanating from the empirical study were presented and conclusions were made regarding the influence of adult basic education and training on Occupational Health and Safety in the mining industry. An overall positive perception was observed towards the influence of adult basic education and training on Occupational Health and Safety, in that the mean response scores were in most cases above 3.

In the analysis a number of shortcomings were also identified in that there is scope for improvements with regards to the provision of ABET and that the organisation under evaluation has not yet reached the preferred maturity stage of interdependence between ABET and OHS. Even though the study population was limited to a single mining house, the underperformances identified could be common in the mining industry at large and contribute to an understanding of current varying health and safety performances in the Industry. This hypothesis can only be validated through further research within a much bigger sample size, inclusive of more than one Mining house.

Results from the empirical study also pointed out that, because of ABET, employees can read safety warnings in the workplace as well as safety instructions given to them by their Supervisors. Secondly, the study highlights the relationship between

employees being able to read and thus understanding what is expected of them in terms of safety instructions and their subsequent execution of such instructions. Lastly the study made it clear that ABET contributes to better Occupational Health and Safety result, but also that the provision of ABET requires more planning and that possible additional approaches should be investigated in the provision thereof.

3.13 Chapter summary

In this chapter, the focus was on discussions related to the research design and methodology used in the empirical study as well as the finding of the empirical study. The focus was also on the procedure and scope of the quantitative as well as the qualitative research done, inclusive of the sample size and survey instrument, namely a questionnaire. All was done in support of the literature review with the aims to meet the research objectives as set out in Chapter 1.

The demographic profile of respondents was analysed and the following were also alluded to: data collection and the specific statistical methods used in analysing the sample data. The empirical results obtained from questionnaire feedback were discussed and the results were tested for reliability and interpreted based on descriptive statistics and further statistical analysis inclusive of a factor analysis.

A frequency analysis, descriptive statistics and the internal consistency together with correlations based on the questions and not specific construct were tested. The influence of adult basic education and training on Occupational Health and Safety was analysed, discussed and reported on. Lastly, the open-ended questions were analysed and reported on as per the qualitative research done.

CHAPTER 4

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Introduction

The final chapter of this study attempts to investigate the primary objective, namely to determine if Adult Basic Education and Training (ABET) could have an impact on Occupational Health and Safety (OHS) and to what extent it enhances awareness of Occupational Health and Safety (OHS) in the Mining Industry. The secondary objectives of this study to be fulfilled in order to achieve the primary objectives were firstly to determine the typical outcomes of Adult Basic Education and Training (ABET) in the Mining Industry, secondly to determine if there is a distinction between pre-Adult Basic Education and Training (ABET) and Post-Adult Basic Education and Training (ABET) employees and thirdly to determine if a correlation exists between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) awareness in the Mining Industry and to determine the impact and influence of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the Mining industry. Lastly the study attempts to present the findings and to incorporate the information into a few critical conclusions and recommendations.

The literature reviewed in Chapter 2 firstly offered information on the history of adult education in South Africa, the Apartheid state as adult education provider, non-governmental organisations (NGOS) between 1970 and 1990 and the macro-economic policy context 1990-1997. The literature review also offered information on Gear and its impact, the NQF and the formalisation of the ABET Policy Document on Adult Basic Education and Training (ABET), the origins of the policy framework, mining and mining conditions in South Africa and the causes of mine accidents and fatalities and lastly on achieving a step change in profitability and safety and the formal education of mineworkers. The findings as obtained from the empirical study in Chapter 3 were done in relation to the literature studies in Chapter 2. The final Chapter aspires to integrate the different chapters and objectives into more significant findings and to draw conclusions for the literature review as alluded to in Chapter 2 and the empirical study as reported on in Chapter 3. In conclusion, recommendations are proposed as to how Adult Basic Education and Training

(ABET) can contribute to diminish the occurrence of fatalities, incidents and accidents in the South African Mining Industry.

4.2. Conclusions regarding the influence of Adult Basic Education and Training on Occupational Health and Safety in the mining industry

The primary and secondary objectives as discussed in §1.6.1 and §1.6.2 were realised as a result from literature as well as empirical studies. The following broader impacts were pointed out and common themes were noted namely, that ABET improves safety in the workplace and that ABET helps to eliminate illiteracy levels and that has an impact on the future of the mining industry. There is a direct correlation between literacy and safety. The higher the literacy levels, the better employees are able to interpret and understand safety requirements, hence improved compliance and responses to risks.

The following **impacts and influences** of ABET on Occupational Health and Safety in the mining industry were pointed out namely that ABET opens the door to learning and development and improves cognitive ability, that in turn increases ability and awareness towards safety, thus has a direct effect on safety performance.

With regards to the **relationship** between ABET and Occupational Health and Safety the following were highlighted namely that the higher the percentage participating in ABET, the greater the potential for safety understanding and procedural compliance and until such time as illiteracy is eradicated, the relationship between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) will remain a necessity.

With regards to the **typical outcomes** of ABET in the Mining Industry, a common theme that stood out was that ABET provides a direct link to redressing matters relating to previously disadvantaged employees. Respondents also commented that ABET provides opportunities for career progression and directly impacts on production and safety performance. It was also pointed out that ABET contributes to a confident and goal orientated workforce that has the potential to lead to self-positive behaviour.

Respondents indicated the following **main differences** between pre-ABET and post-ABET in that ABET introduces a culture of learning and provides the foundation for acquiring knowledge and skills and post-ABET provides employees with the opportunity to be further developed.

4.2.1 Comments

The results from the empirical study shows that illiteracy leads to mine related incidents, accidents, fatalities, loss of production, and unacceptable safety performances and that ownership of safety performances lies with the Company and employees alike. That ABET provides the necessary skills for employees to better themselves in the workplace and to contribute to the economy of the country and to society at large and that ABET contributes to literate employees that can read and understand safety instructions.

The results from the empirical study also indicate that ABET and formal education contributes better safety performances and practices and that current solutions to poor safety performances do not address the root causes thereof. Due to ABET, work related instructions can be executed and employees can read warning signs that indicate potential hazards. That more realistic planning of ABET is required that can contribute to the reduction of incidents, accidents and fatalities and ensure the transfer of ownership of safety performances and positive behaviours to the employee. Lastly the empirical study also indicates that ABET is a contributing factor to potentially training and development of employees.

4.3 Key recommendations for approaches to Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) training of mineworkers

Health and Safety training of underground mineworkers will necessitate new subject matter or content education in the framework of continued technological development, combined with low levels of formal education that resulted in limited knowledge of relevant subjects and related areas such as adult learning. The implementation of Unit standards and their effectiveness depend on the quality thereof and any intended individual empowerment approaches must allow for maximum adherence to the curriculum.

The implementation of transformative adult learning approaches will require disciplined and cohesive approaches, as there will be serious and unavoidable challenge in the learning process and new learning material required that are underpinned by the cognitive and intellectual challenges and alignment to industry requirements (Cranton, 2002:66; Tuchten, 2011:189-190).

Adult Basic Education and Training (ABET), as a now established discipline, has the potential to not only contribute to research, but also to the body of available literature, with specific reference to adult learning and engagement with adult learners. However, the quality of training in the sector is problematic and is an issue that the MQA is currently addressing (Frankel, 2010:44; MQA, 2010:62; MQA, 2011:91; Tuchten, 2011:191).

An integral part of Adult Basic Education and Training (ABET) should be the core focus points namely:

- Quality and effectiveness of the Occupational Health and Safety (OHS) training programmes;
- The inclusion of Health and Safety electives in the Adult Basic Education and Training (ABET) curriculum for ABET levels 1 – 4;
- More research into the correlation between adult learning and experience; and
- H&S learning in the form of new content, skill, insights and or behavioural changes Tuchten (2011:191).

Table 4.1 indicates the key recommendations, and the value add thereof can be realised in terms of better planning and provision of Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) training of mineworkers. Ownership of Occupational Health and Safety (OHS) practices and behaviours. Better Occupational Health and Safety (OHS) management on all levels and improved communication. All of these factors have the potential to accumulatively contribute to more literate employees and less fatalities, incidents and accidents in the mining industry at large.

Table 4.1: Proposed key recommendations for approaches to Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) training of mineworkers

Realistic planning and provision of ABET and H&S training	• Enhance quality of training and learning material and the reduction of wastage. • Establish and reinforce a culture of learning. • Remove learning barriers – create capacity to send people for H&S training as well as ABET training. • Proactive training. • Increase informal training. • Enable peer teaching. • Greater focus on the retention of knowledge of standards. • Proper learning design. • Quality of facilitation. • High standard assessment. • On job coaching. • Specific skills courses. • Specialised capacity building courses. • Formal practical courses under coaching. • Formal exposure under supervision. • Supervisory and leadership development.
Ownership	• Establish higher standards for compliance and behaviour. • Bring back accountability for developing employees. • Role clarification and responsibility. • Consequential thinking – understanding consequences.

	• Locus of control. • Capacity building. • Confidence in ability. • Careful reasoning. • The use of judgement in assessing information. • Achieving predetermined results. • Awareness of the implications of proposed actions. • Analysis of relationships between previously unrelated sets of information to identify possible future implications and consequences.
Management of H&S	• Enhanced behavioural based safety training and consequential thinking. • Renewed focus on hazard identification and risk assessments. • Reinforcing basic health and safety practices. • Revision of Mine policies and processes subject to change. • Enhanced Mine standards Summative Assessment.
Communication	• Enhanced management communication. • The ABET and H&S training programs should allow for interaction between workers and all other stakeholders. • It should be clearly articulated as to methodology to be used (how employees and management should discuss, plan and practise new learning). • The communication aspects of the training

	programmes to be managed by all stakeholders.
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4.4 Additional findings and recommendations

The literature review in Chapter 2 covered the policy document on Adult Basic Education and Training (ABET), the origin of the policy framework as well as the NQF and the formalisation of ABET. This has to be placed in the context of the effects of national policy on mining, education and training in relation to their impact on the training of mine workers. Cognisance has to be taken of the fact that existing policies affect Occupational Health and Safety (OHS) training in terms of priorities and the allocation of resources by Government organisations (Tuchten, 2011:204).

Of great concern is the structure of the NQF because of its exclusion of a great number of South African adults of possible unit standard-aligned training options, with specific reference to mine workers and those whose schooling ended before the equivalent of NQF Level 1 or Grade 9 in the mining industry, that employs large numbers of elementary, unskilled or semi-skilled workers. Literature reviewed in Chapter 2 revealed that insignificant progress has been made in reducing adult illiteracy since the end of the Apartheid era (Aitchison, 2008:1; Baatjes, 2008:206, 224; Aitchison & Harley, 2006; 98-99; Rule, 2006:117). Since the NQF Level 1 descriptor mandates comprehensive reading and writing skills, the NQF level descriptors apply to all unit standard-based training programmes, whether they are classified and regarded as full qualifications or not. With regards to the process of recognition of prior learning (RPL) it is evident that employees may not have the necessary informal skills to qualify in terms of the level descriptors. Subjective evidence point to the contrary in that level descriptors are not really applied during industry-based RPL processes and the theoretical aspects of training are subsequently, in most instances not recognised by employers. The Occupational Health and Safety (OHS) training and training material of employees are decided on by the employers or the training providers appointed by sectoral training authorities, for example the MQA (Mining Qualification Authority). Workers who attend Adult

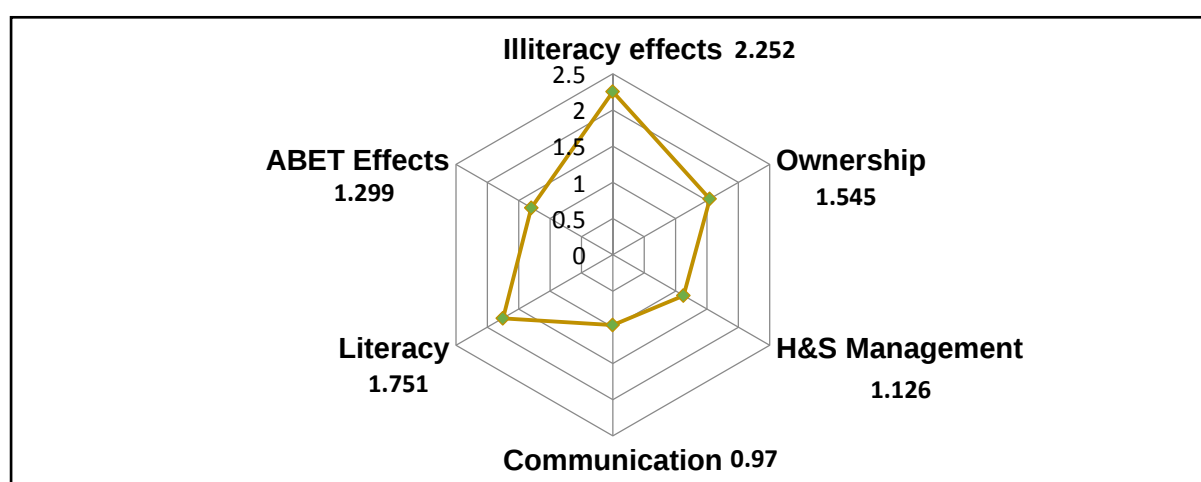
Basic Education and Training (ABET) should be offered the opportunity to choose Occupational Health and Safety (OHS) electives from level 1 onwards to ensure that essential skills provision, such as H&S training, for many workers classified as elementary, unskilled or semi-skilled, are provided for (Tuchten, 2011:204).

1. Furthermore Adult Basic Education and Training (ABET) should increase its impact in the mining industry in order to be viewed as a primary channel for Occupational Health and Safety (OHS) training and Occupational Health and Safety (OHS) training should specifically focus on health and safety risks;
2. Compulsory Occupational Health and Safety (OHS) skills programmes for all post Adult Basic Education and Training (ABET) level 4 mine employees;
3. Occupational Health and Safety (OHS) training and all operators training to be combined as one subject within the scope of the NQF and associated levels and unit standards;
4. The training of countless vulnerable workers to be given the necessary guidance or accountability by Mine Management;
5. Training logic and its implementation processes require renewal;
6. A public, regulatory framework or set of guidelines for the compulsory Occupational Health and Safety (OHS) training or preparation of mineworkers with limited formal schooling, that comprise of the majority and most vulnerable employees in the local mining sector; and
7. Policies and directives originating from both the mining and the education training sectors to make Occupational Health and Safety (OHS) training a priority intervention for the mining sector (Tuchten, 2011:205-208).

Figure 4.1 is an indication of the sum of the items that has been deleted and plotted on a Radar Chart. From figure 4.1 it is evident that the construct with the lowest overall Cronbach's Alpha if Item Deleted is Communication with a score of 0.970 and Illiteracy effects with a score of 2.252 as the highest.

- The following items require urgent attention namely:
- Communication;
- Health and safety effects; and
- ABET effects.

Figure 4.1 Radar Chart of Constructs



From Figure 4.1 it is evident that the constructs that are now indicative of a New Model in terms of the approaches to Adult Basic Education and Training (ABET) and the Occupational Health and Safety (OHS) training of mineworkers, warrants further research in the Mining Industry at large and inclusive of all the Mining Houses in South Africa. This factor can also be regarded as a limitation to the study. Furthermore, the researcher did not know whether the newly formed constructs had to be added or multiplied to derive at the most sought after results. This factor in itself needs further investigation and research, as it was not in the initial scope of the study.

4.5 Limitations and implications for further research

It is imperative to identify the possibility for further research, taking into consideration the conclusions and recommendations made in this empirical study. Taking cognisance of the participants in the study that included five Operational Units and Senior managers to Adult Basic Education and Training (ABET) learners, the findings in this report cannot be generalised to the mining industry in South Africa at large due to the use of a non-probability convenience sample.

Additional limitations of this study is that the empirical research focused singularly on Adult Basic Education and Training (ABET) in the mining industry and the effect thereof on Occupational Health and Safety (OHS) with a limited focus on behavioural aspects of employees as well as the methods used in ABET facilitation, the content of learning material and other industries.

Further studies could be investigated on the above mentioned aspects that were not investigated in the initial study. Regardless of these limitations, this study has added to the empirical body of Adult Basic Education and Training (ABET) in the mining industry and the effect thereof on Occupational Health and Safety (OHS) in South Africa.

4.6 Recommended further studies

The mini-dissertation is concluded and according to the findings of the study there are numerous opportunities for further research. It has become evident that not much research has been done with regards to the influence of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the mining industry and that many opportunities exists for further research. The following aspects could be researched namely:

- Actual provision of training and preparation of underground mineworkers;
- Alternative and additional Occupational Health and Safety (OHS) *training* initiatives for underground workers;
- Compulsory Occupational Health and Safety (OHS) skills programmes for all post ABET level 4 mine employees; and
- Analysis of methods used in Adult Basic Education and Training (ABET) facilitation.

4.7 Conclusion

The aim of this study was to investigate the influence of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the mining industry. Exploratory research was done, firstly to investigate if Adult Basic Education and Training (ABET) could have an impact on Occupational Health and Safety (OHS) and to what extent it enhances awareness of Occupational Health and Safety (OHS) in the Mining Industry and secondly to determine typical outcomes of Adult Basic Education and Training (ABET) in the Mining Industry and if there is a distinction between pre-Adult Basic Education and Training (ABET) and Post-Adult Basic Education and Training (ABET). Lastly research was done to determine if a correlation exists between Adult Basic Education and Training (ABET) and

Occupational Health and Safety (OHS) awareness in the Mining Industry and to determine the impact and influence of Adult Basic Education and Training (ABET) on Occupational Health and Safety (OHS) in the Mining industry.

The findings of the survey revealed an overall positive perception towards the influence of adult basic education and training on Occupational Health and Safety, in that the mean response scores were in most cases above 3. In the analysis, a number of shortcomings were also identified in that there is scope for improvements with regards to the provision of Adult Basic Education and Training (ABET) and that the organisation under evaluation has not yet reached the preferred maturity stage of interdependence between Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS).

4.8 Chapter summary

This chapter concluded the results of the literature review as well as the survey used in the empirical research. The findings were summarised, conclusions and recommendations were made towards key approaches to Adult Basic Education and Training (ABET) and Occupational Health and Safety (OHS) training of mineworkers.

The key approaches (new model) can be summarised as follows:

- Realistic planning and provision of ABET and H&S training;
- Ownership;
- Management of Health and Safety; and
- Communication.

It was also recommended that Adult Basic Education and Training (ABET) should increase its impact in the mining industry in order to be viewed as a primary channel for Occupational Health and Safety (OHS) training and that Occupational Health and Safety (OHS) training should specifically focus on health and safety risks. It was also recommended that compulsory Occupational Health and Safety (OHS) skills programmes for all post-Adult Basic Education and Training (ABET) level 4 mine employees be put in place and that Occupational Health and Safety (OHS) training and all operator training be combined as one subject within the scope of the NQF

and associated levels and unit standards. It was further recommended that the training of countless vulnerable workers be given the necessary guidance or accountability by Mine Management and that training logic or its implementation processes require renewal. It was recommended that a public, regulatory framework or set of guidelines for the compulsory Occupational Health and Safety (OHS) training or preparation of mineworkers with limited formal schooling, who comprise of the majority and most vulnerable employees in the local mining sector, be put in place. Lastly it was recommended that policies and directives originating from both the mining and the education training sectors to make Occupational Health and Safety (OHS) training a priority intervention for the mining sector, be realized (Tuchten, 2011:205 -208). The limitations and implications for further research were discussed and suggestions were made towards further studies.

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APPENDIX A

Adult Basic Education and Training (ABET) and Safety questionnaire

Dear Colleague

Thank you for taking time to answer this questionnaire. The research aims to identify the areas of opportunity for improving Adult Basic Education and Training (ABET) in order to improve Occupational Health and Safety (OHS) performances in the Mining Industry.

Your participation in this study is completely voluntary and there are no foreseeable risks associated with it. All questionnaire responses will be strictly confidential and data from this research will be used as part of my MBA dissertation.

The questionnaire consists of 55 statements associated with safety related aspects in your daily work environment and the role of Adult Basic Education and Training (ABET) in the workplace. It will take approximately 15 minutes to complete.

Ethical clearance has been obtained from the NWU Potchefstroom Business School: EMS15/02/26/-1/02 as well as from Sibanye Gold in terms of the Companies confidentiality and copyright agreement and requirements.

Will you please be so kind as to fill in the questionnaire on / before 28 August 2015?

Kind regards

Researcher:	Supervisor:
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Telephone: 011 752 4026 / 082 7763 555	Telephone: 018 299 4012 / 082 821 7177

MBA final year: MWU, Potchefstroom Business School

Please reflect your honest opinion of the statement to ensure an accurate measure.

Please select which of the following applies to you:

1.	Gender	Male		Female		
2.	Age	18 – 25	26 - 35	36 - 45	46 - 55	56 - 65
3.	Race	White	Black	Coloured	Indian	Other
4.	Qualifications	Grade 12 / No schooling	Diploma / Cert	B Degree	Hons Degree	Masters / PhD
5.	ABET Centre	Beatrix	Kloof	Driefontein	Cooke 123	Cooke 4
6.	Please state your position in the Organisation	Senior Manager	Line Manager	Training Officer / Supervisor	ABET Facilitator	ABET Learner
..	<i>Instruction: Please answer or respond to the following questions or statements as accurately and truthfully as possible</i>					
	Questionnaire	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
7.	Because of ABET employees can read safety warnings in the workplace					
8.	Because of ABET employees can read written safety instructions given to them by their Supervisors					
9.	Because of ABET employees can communicate better in the workplace					
10.	Sufficient time and effort is committed to safety in the organisation					
11.	Management listens to safety ideas and concerns and take appropriate action					
12.	I can read the safety information that is communicated to me on a regular basis should it not be understood					
13.	Most employees are aware of potential hazards in their work environment and can read signs that indicate potential hazards					
14.	Relevant safety information is communicated to me that I can read and understand					
15.	Every employee is accountable for their own safety					
16.	Employees receive adequate safety training					
17.	Work instructions and procedures can be read and therefore implemented					
18.	Employees should assist fellow workers by reading safety					

	signs to them					
19.	My supervisor /manager shows complete trust in my ability to identify risks because he / she assumes that I can read and write					
20.	Safety is seen as a condition of employment					
21.	Being rewarded for good safety performance helps to promote ABET as an opportunity to learn to read and write					
22.	The majority of incidents and accidents are due to employees not being able to read and write					
23.	Management cares about the safety and wellbeing of their employees					
24.	Some people get away with unsafe acts because they cannot read or write					
25.	Solutions for safety performance are most often short term and do not address the root cause					
26.	The reason for not achieving safety targets is because employees cannot read or write					
27.	The organisation keeps on getting the same accidents time and again					
28.	Management has an open door policy when it comes to safety					
29.	I am encouraged to make safety suggestions in writing					
30.	ABET provides a culture of learning to ensure employees acquire skills and knowledge to ensure that they make a purposeful contribution to the social, economic and political arena in the country.					
31.	ABET not only focus on literacy but also post- literacy and the education of adults to ensure they receive the necessary training and development for income generating purposes.					
32.	A more realistic planning and provision of ABET is required to add to the understanding of ABET and to seek additional approaches to ABET as well as the inclusion of Occupational Health and Safety training as part of the ABET electives					
33.	ABET and formal education contributes to better Occupational Health and Safety figures?					
34.	The lack of education amongst employees contributes to more accidents, incidents and fatalities in the mining industry?					

35. Does ABET assist in demonstrating an understanding of how to participate effectively in the workplace?	YES	NO	Don't know
36. Does ABET assist in identifying security, safety and environmental risks in the work place?	YES	NO	Don't know
37. Does ABET assist employees to engage in a range of speaking / signing and listening interactions for OHS (Occupational Health and Safety) purposes in the work place?	YES	NO	Don't know
38. Does ABET prepare employees to perform basic life support and first aid procedures?	YES	NO	Don't Know
39. Does ABET contribute to better OHS (Occupational Health and Safety) in the workplace?	YES	No	Don't know
40. Does ABET assist with reading and writing skills of workers to enable them to identify Health and Safety signs, instructions and communication?	YES	No	Don't know
41. Are workers more able to understand Health and Safety instructions in the workplace because of ABET?	YES	NO	Don't know
42. Are workers more able to take on new Health and Safety tasks because of ABET?	YES	NO	Don't know
43. Is there a connection between pre-ABET and post ABET and enhanced OHS (Occupational Health and Safety) in the workplace?	YES	NO	Don't know
44. Is poor OHS (Occupational Health and Safety) related to a lack of reading and writing skills of employees in the workplace?	YES	NO	Don't Know
45. Employees will spend more time to complete a job safely rather than rushing to finish the job?	YES	NO	Don't know
46. Safety is driven by management and not the employees because they cannot read or write?	YES	NO	Don't know
47. Literacy will lead to good safety performance and good business performance?	YES	NO	Don't know
48. Some people get away with unsafe acts because they cannot read or write?	YES	No	Don't know
49. According to the White Paper on Education (1995) all persons, children, youth and adults have a right to basic education. Were you aware of this?	YES	NO	Don't Know
50. Do you think that not taking annual leave contributes to more accidents incidents and fatalities in the Mining Industry?	YES	NO	Don't know
51. Briefly describe the broader impact of ABET on the Health and Safety performance in your organisation			
52. What do you think is the impact and influence of ABET on Occupational Health and Safety in the mining industry?			

53. What do you think is the relationship between ABET and Occupational Health and Safety in the Mining Industry? ----- ----- -----
54. What do you think are the typical outcomes of ABET in the Mining Industry? ----- ----- -----
55. What do you think is the difference between pre – ABET and post ABET? ----- ----- -----

Thank you for completing this questionnaire

APPENDIX B

South African Qualifications Authority, Registered Unit Standard Number: 244383.



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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

REGISTERED UNIT STANDARD:

Conduct continuous hazard identification and risk assessment within a workplace

SAQA US ID		UNIT STANDARD TITLE		
244383		Conduct continuous hazard identification and risk assessment within a workplace		
ORIGINATOR				
SGB Mining and Minerals				
QUALITY ASSURING BODY				
-				
FIELD			SUBFIELD	
Field 06 - Manufacturing, Engineering and Technology			Fabrication and Extraction	
ABET BAND	UNIT STANDARD TYPE	PRE-2009 NQF LEVEL	NQF LEVEL	CREDITS
Undefined	Regular	Level 2	NQF Level 02	2
REGISTRATION STATUS		REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Reregistered		2015-07-01	2018-06-30	SAQA 10105/14
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT		
2019-06-30		2022-06-30		

In all of the tables in this document, both the pre-2009 NQF Level and the NQF Level is shown. In the text (purpose statements, qualification rules, etc.), any references to NQF Levels are to the pre-2009 levels unless specifically stated otherwise.

This unit standard replaces:

US ID	Unit Standard Title	Pre-2009 NQF Level	NQF Level	Credits	Replacement Status
116655	Conduct continuous hazard identification and risk assessment within a workplace	Level 2	NQF Level 02	2	Complete

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful for persons who are required to conduct continuous hazard identification and risk assessment within an underground working place to ensure a healthy and safe

environment to work in.

People credited with this unit standard are able to:

- Explain the specified requirements pertaining to continuous hazard identification and risk assessment.
- Prepare for hazard identification
- Identify hazards and assess risks.
- Initiate remedial and follow-up action.

The knowledge and understanding demonstrated within this unit standard contribute to social and economic transformation and the upliftment and economic growth of the mining and minerals sector by conducting continuous hazard identification and risk assessment as part of the mining process.

This unit standard is intended to promote general knowledge and understanding of persons responsible for conducting continuous hazard identification and risk assessment in the mining and minerals sector in order to ensure knowledgeable, competent and informed workers.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard:

- Follow basic Occupational Health and Safety practices underground at NQF Level 1.

UNIT STANDARD RANGE

Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Explain the specified requirements pertaining to continuous hazard identification and risk assessment.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The explanation of the legal requirements in terms of the employer's responsibility to assess and respond to risk is consistent with specified requirements.

ASSESSMENT CRITERION 2

The legal definitions pertaining to hazard identification and risk assessment are explained.

ASSESSMENT CRITERION RANGE

Definitions must include:

- Hazard.
- Risk.
- Occupational health.
- Reasonably practicable.
- Safety.
- Occupational Health and Safety Committee.
- Tolerable risk.

ASSESSMENT CRITERION 3

The explanation of the purpose of each type of hazard identification and risk assessment procedure is consistent with specified requirements.

ASSESSMENT CRITERION RANGE

Procedures must include:

- Baseline.
- Issue-based.
- Continuous.

ASSESSMENT CRITERION 4

The explanation of the main components of a continuous hazard identification and risk assessment procedure is consistent with specified requirements.

ASSESSMENT CRITERION 5

The explanation of the importance of identifying, dealing with and reporting hazards in terms of the consequences to occupational health, safety, environment and production is consistent with specified requirements.

SPECIFIC OUTCOME 2

Prepare for hazard identification.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The required personal protective equipment is available, in good working order, fit for purpose, and used in accordance with its design and specified requirements.

ASSESSMENT CRITERION 2

The identification of relevant documents to assist in identifying hazards is according to specified requirements.

SPECIFIC OUTCOME 3

Identify hazards and assess risks.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Hazards are identified and risks are assessed according to specified requirements.

ASSESSMENT CRITERION 2

Identified hazardous conditions are recorded according to specified requirements.

ASSESSMENT CRITERION 3

Interpersonal interaction is positive, consistent with specified requirements and promotes effective teamwork.

SPECIFIC OUTCOME 4

Initiate remedial and follow-up action.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The significant risks that were assessed from hazardous conditions are dealt with according to specified requirements in terms of promptness and order of significance.

ASSESSMENT CRITERION 2

Reports are completed and submitted according to specified requirements.

ASSESSMENT CRITERION 3

Follow-up action is initiated and implemented according to specified requirements.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- Anyone assessing a learner against this unit standard must be registered as an assessor with the relevant ETQA.
- Any institution offering learning that will enable achievement of this unit standard must be accredited as a provider through the relevant ETQA by SAQA.
- Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines and the agreed ETQA procedures.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The following embedded knowledge is addressed in an integrated way in the unit standard:

Procedures and techniques:

- Hazard identification and risk assessment techniques.

Regulations, legislation, agreements, policies, standards:

- Safety, occupational health and environmental legislation and regulations.
- Quality policies, standards and agreements.

Relationships, systems:

- Interpersonal interaction with team members.

UNIT STANDARD DEVELOPMENTAL OUTCOME

N/A

UNIT STANDARD LINKAGES

N/A

Critical Cross-field Outcomes (CCFO):**UNIT STANDARD CCFO IDENTIFYING**

Identify and solve problems and make decisions using critical and creative thinking.

Note: The ability of the learner to understand the action to be taken should environmental conditions and personal acts not conform to standard.

UNIT STANDARD CCFO WORKING

Work effectively with others as members of a team, group, organisation or community.

Note: The ability of the learner to understand the action to be taken to safeguard fellow workers against unsafe environmental conditions and unsafe acts.

UNIT STANDARD CCFO ORGANISING

Organise and manage themselves and their activities responsibly and effectively.

Note: The ability of the learner to identify hazards and risks in an underground workplace and to understand the effects of sub standard conditions.

UNIT STANDARD CCFO COLLECTING

Collect, analyse, organise and critically evaluate information.

Note: The ability of the learner to analyse and determine risks and deal with them accordingly.

UNIT STANDARD CCFO COMMUNICATING

Communicate effectively, using visual, mathematical and/or language skills in the modes of oral and/or written presentations.

Note: The ability of the learner to effectively complete and submit reports will indicate his/her proficiency in effective communication.

UNIT STANDARD CCFO SCIENCE

Use science and technology effectively and critically showing responsibility towards the environment and occupational health of others.

Note: The learner demonstrates an understanding of and ability to use advanced mining technology in terms of production, safety and communication.

UNIT STANDARD CCFO DEMONSTRATING

Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

Note: The ability of the learner to act when and where required by understanding the implications and impact of his actions within the company.

UNIT STANDARD ASSESSOR CRITERIA

N/A

UNIT STANDARD NOTES

This unit standard replaces unit standard 116655, "Conduct continuous hazard identification and risk assessment within a workplace", Level 2, 2 credits.

Terminology:

Specified requirements:

Specified requirements include legal and site-specific requirements and are contained in one or more of the following documents:

Legal:

- Relevant Acts: e.g. Mine Health & Safety Act, 1996 (Act no 29/1996), and Minerals Act and Regulations, 1991 (Act no 50/1991).
- Mandatory Codes of Practice.
- OSANS and other relevant Standards.

- Chief Inspector of Mines' Directives.

Site specific:

- Hazard Identification and Risk Assessments (HIRA).
- Occupational Health and Safety Risk Management Programme.
- Voluntary Codes of Practice.
- Managerial Instructions.
- Mine Standard Procedures.
- List of Recorded OH&S Risks.
- Working Guides.
- Equipment and Materials Specifications of 1993.

Notes to Assessors:

Assessors should keep the following principles in mind when designing and conducting assessments against this unit standard:

- Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, focus assessment around each specific outcome, or groups of specific outcomes.
- Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the learner is able to perform in the real situation.
- Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
- The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.
- The task of the assessor is to gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the learner can achieve the outcomes again and again and again. This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.
- All assessments should be conducted in line with the following well documented principles of assessment: appropriateness, fairness, manageability, integration into work or learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Unit standard justification:

Level:

Attribute; Level; Justification:

- Skills; Level 2; Moderate in range.
- Procedures; Level 2; Established and familiar.
- Context; Level 2; Routine and familiar.
- Knowledge; Level 2; Basic operational.
- Information processing; Level 2; Basic processing of readily available information.
- Problem Solving; Level 2; Known solutions to familiar problems.
- Orientation of activities; Level 1; Directed.
- Application of responsibility; Level 2; Under general supervision and quality control.
- Orientation of scope of responsibility; Level 2; Some responsibility for quantity and quality, and possible responsibility for guiding others.

- Average Level: $17/9 = 1.9$; Actual Level Assigned: 2.

Credits:

Total hours required by the learner to achieve the required outcome:

Activity; Hours.

- Classroom Teaching; 9 hours.
- On-The-Job Training; 9 hours.
- Mentoring required; 0 hours.
- Other (Specify); 0 hours.
- Total; 18 hours.

- Credits Achieved: $18/10 = 1.8$; Actual Credits Assigned: 2.

QUALIFICATIONS UTILISING THIS UNIT STANDARD:

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Core	58739	National Certificate: Mining Operations for Underground Hard Rock	Level 2	NQF Level 02	Reregistered	2018-06-30	MQA

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