GORDON INSTITUTE
OF BUSINESS SCIENCE
University of Pretoria

Evaluating the effectiveness of ethical decision-making training in a South African organisation

by

Nkosinathi Zwane

Student number: 28529406

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfillment of the requirements for the degree of Master of Business Administration.

11 November 2009

Abstract

Ernst and Young have been identifying regulation and compliance as business' top three risks for the last three years. Given the increasing ethical challenges in business, most organisations have tried to curb the situation by code of ethics, values, creating new ethics positions, offering compulsory ethics training and creating whistle blowing channels. The key problem identified was the fact that employees don't always make appropriate decisions on ethical matters in spite of company policies and legislations.

In this study, the impact of ethics training on moral judgement has been investigated. Hence the title is 'evaluating the effectiveness of ethical decision making training in a South African organisation.' Moral judgement was used in the context of Rest (1984) model. Additionally the size of the improvement was benchmarked with other studies.

A quasi experiment was conducted to check if there were differences between managers that were trained and those that were not. Data was collected using a self-administered proprietary Defining Issues Test (DIT-2). The test tool has been validated by many scholars.

Results showed that there was no difference between trained managers and the control group. Secondly, the offered training did not improve manager's moral reasoning higher than the benchmark. Recommendations for training review and future research suggestions were made.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorization and consent to carry out this research.

_____

Nkosinathi Jeremiah Zwane

Acknowledgements

I would like to thank my supervisor, Gavin Price for his much needed guidance and support throughout the project. I am always thankful about my family especially my wife who has been supportive and understanding for the most part of the last two years. I would also like to thank Zola Mining (fictitious name) and its staff for opening their doors and hearts for an enquiry about their ethics training programme.

Abbreviations

DIT	Defining Issues Test
EDM	Ethical Decision Making
FOR	Frame of reference
GDP	Gross domestic product
JSE	Johannesburg Stock Exchange
MES	Multidimensional Ethics Scale
MJT	Moral Judgement Test
PI	Pluralistic Ignorance

TABLE OF CONTENTS

List of tables

List of figures

1. Introduction to Research Problem

1.1 Introduction

After some significant financial scandals around the world, such as those of Worldcom, Enron and Arthur Andersen various United States bodies have appealed to the public for greater emphasis on ethical matters (Ho and Lin, 2008). Recently in South Africa, Tiger Brands was fined R98 million which constituted 5.7% of their revenue for the 2006 financial year for being party to a price fixing cartel (Mail & Guardian, 2007). Sasol Wax division was also fined R3.7 billion by the European Union's competition regulator for leading a price-fixing cartel (The Star, 2008).

Some companies that have the best ethical intentions often find themselves having to deal with unethical behaviours of key individuals. These unethical behaviours cost companies, shareholders and communities billions of dollars. The losses of such scandals are not only financial; they could influence employee ethical intentions (White and Lean, 2008); they could impact on staff motivation or organisational commitment (Pelletier and Bligh, 2008); they could also result in moral disengagement (Moore, 2008).

There is no doubt that such companies had policies, procedures, code of ethics and values in place. A classical study of 350 firms by Mathews in 1988 (cited in O' Grady, 2002) revealed that firms with written code of ethics were more often charged with wrongdoing than those without such codes. Such a finding suggests that merely having a written code of ethics is not enough to curb unethical behaviour.

A question that arises is what more should organisations do, to effectively minimise the possibility of such rampant unethical behaviours? Can employees be trained to act more ethically? This research asked the question how effective is formal training in influencing ethical decision-making.

1.2 Purpose of the study

Ernst and Young publishes an annual top ten business risk report. For the last three reports, regulation and compliance have been on the top three (Ernst & Young, 2009). Issues around ethics deserve attention from any business leader.

The purpose of the study was to evaluate relative improvement in ethical decision-making capability as a result of attending formal training when compared to no training provided. In addition, the study aimed to investigate if the expected improvement would be equal or better than a benchmark value which will be discussed in chapter three.

1.3 Research objective

The main research objective was to assist companies to critically evaluate the ethics training offered to their managers. The conclusion does offer recommendations that organisations should consider. This research has also contributed to academic body of knowledge; South African learning institutions could refer to findings closer to home.

1.4 Research motivation

Researchers like Halbesleben, Wheeler and Buckley (2005) said despite enormous literature on ethics education, few studies have found support for effectiveness in changing an individual's ethical standards through programmatic training.

In order to close this gap Halbesleben *et al* (2005) propose to reduce pluralistic ignorance (a social cognitive error) which will result in effective business ethics education. Hartog, 2004 have proposed action learning as a reflective practice and development). Prinsloo, Beukes and de Jongh, 2006 have argued for a whole person learning approach. Vitell and Singhapakdi (2008) have requested that ethics institutionalization be studied within the context of different types of industries, cultures and professions. Researchers like de Colle and Werhane (2008) have pondered about the interaction between formal and informal elements training programs.

Beekun, Hamdy, Westerman and Hassab-Elnaby (2008) have highlighted a need for further research to develop a more complete understanding of antecedents to ethical decision making. They claim that the more complete understanding will enhance effects of formal ethics training and interventions in a multicultural and diverse global environment (Beekun *et al*, 2008).

The common aim of ethics training was to improve employee moral decision making (Ritter, 2006; Halbesleben *et al*, 2005). Though there was an

overwhelming consensus on the issue of training, there was a limited consensus on the content and the method of training.

It was in context of that debate that this enquiry on the effectiveness of formal training on ethical decision making was made.

1.5 Research relevance to South Africa

South Africa is often not exempt from Africa's or third world economies' negative perception on ethical issues (Transparency International website, 2009). Unethical decisions could be made in politics, in NGO's, in churches, in public services and in domestic settings. Business ethics formal training was found to be a necessary enquiry on the South African context given its rich diversity and historic background.

To make inferences to South Africa, a large South African enterprise was chosen because it had provided formal training over a period of sixteen months. It is because of the size of the organisation, a sample would be representative of the country's corporate demographics.

1.6 Research scope

Firstly, participants' actual behaviour will not be assessed as part of this research, but their moral judgement or moral reasoning level according the Rest's 1984 framework. Secondly the research will not evaluate training

content or way of delivery but overall effectiveness. Thirdly only people in South Africa will be sampled.

1.7 Research approach

In order to realise the research objectives a quasi experiment methodology was adopted. The methodology was appropriate since experiment variables like selection of employees to attend the training were not under the control of the researcher. By definition quasi experiment design is an experiment that fails to control adequately for loss of external or internal validity (Zikmund, 2003).

Two groups were used to achieve research objectives. One group was used as a control group composed of managers that did not attend the said training. The second group was composed of the trained managers. Data was collected from both groups using the same test instrument. The instrument was administered using pencil and paper. Subjects' responses were then analysed to determine individual's moral development score. The scores were then analysed for the purposes of proving or disproving the research hypothesis.

1.8 Statement of research problem

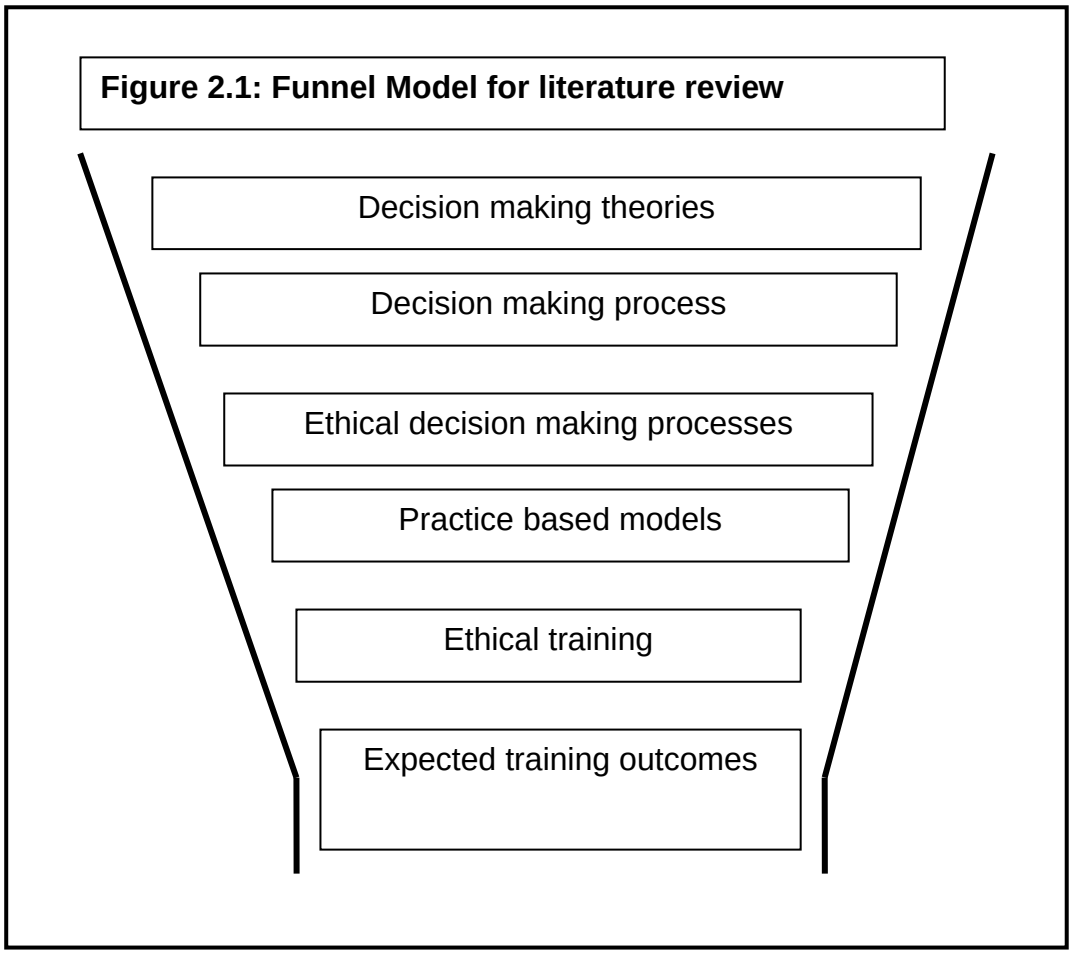
The success of this research rests in **evaluating the effectiveness of ethical decision-making training**. To this end, the research aimed to prove or disprove that training does improve moral reasoning. Training effectiveness could be achieved by managing many individual variables like age, religion and locus of control.

Job context like management expectations play a role in training effectiveness. Organisational context such as organisational culture and the external environment like professional code of ethics are also important in influencing training effectiveness. This research will not evaluate such individual variables of effectiveness, but the overall impact of the training.

2. Literature review

2.1 Introduction

Several articles have been reviewed to understand the elements of effective training on ethical decision-making. The articles range from decision making theories and processes to practice based models and training outcomes. In order to structure the thinking process around business ethics training, a literature review funnel model was adopted.



2.2 Decision-making theory

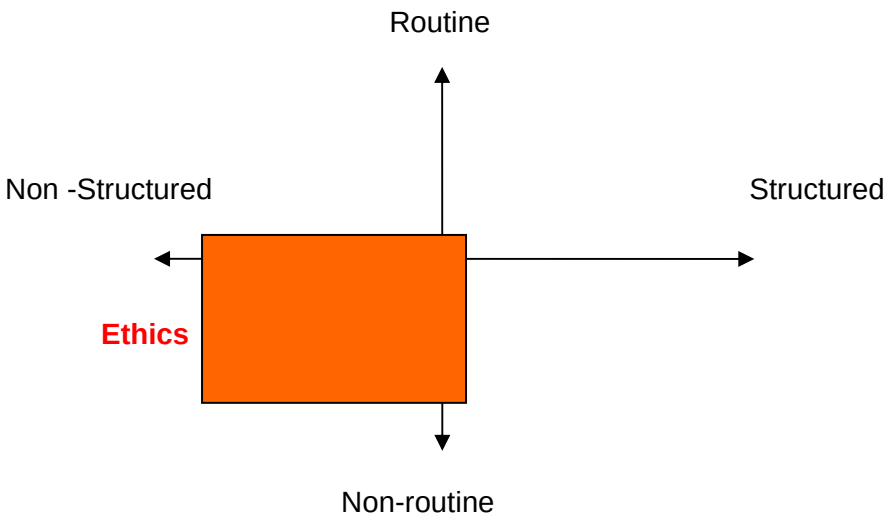
There are many theories around the way people make decisions, Heller, Drenth, Koopman, and Rus, (1983) felt that they should be called contingent models because there is no one best way of decision making.

Yin (2002) grouped decision-making theories into four types. His first group was individual theories which sought to understand individual behaviour. The second group sought to explain group behaviours. The third group involved organisational theories which explained organisational behaviour. The final group referred to how societies behave and make decisions. This research focused on the individual behaviour.

Each of Yin's (2002) groups mentioned above could make decisions within continuums. Decision making has been studied and portrayed in a continuum ranging from routine to non-routine decisions (Heller, Drenth, Koopman, and Rus, 1983). Covrig (2000) believes that organisational decisions can be characterised as routines, challenges and dilemmas. He stresses the importance of leadership in breaking dilemmas. The continuum could also be from structured to unstructured decisions making which is marked by uncertainty, complexity or conflict (Heller *et al*, 1983).

This enquiry slanted more on the non-routine side of the continuum, see Figure 2.2 below. Ethical decision making was treated as leaning towards unstructured side.

Figure 2.2: Sketch of thinking continuums



When one looks at the non-routine side of the continuum, it involves people thinking about alternatives or possible outcomes of their actions. Heller *at al*, (1983) cite Simon who was the first one to point out that decision making process does not follow logical order as was pointed by then classical models.

Thinking in decision making

Altier (1999) asserts that having a skill to use thinking processes is not the same as simply being intelligent. One of the implications of the 'intelligence trap' is excellent minds stuck in bad ideas just because they defend them well. Edward de Bono (1990) also believes that traditional thinking is based on an adversarial system where on party wants to prove the other party wrong. Altier

and de Bono seem to agree with Simon's observation that decision making is not always logical.

Thinking processes can be categorised in to analytical thinking and systems thinking (Altier, 1999). Systems thinking solve complex problems through expansion. It seeks to determine components that interact with each other and how they affect the big picture. Moral dilemmas present complex situation with sometimes unknown outcomes. Thus business ethics would be more on the systems thinking side.

2.3 Decision making process

The decision making process which training is intended to influence has been modelled by various researchers including Solomon (1992) and the Ferrell and Gresham contingency framework (Ferrell and Fraedrich, 1991). Kuhn's model of 1963 is one of such (cited in Farrell & Farrell 1998).

Kuhn's model has five steps:

1. Stimulus,
2. Search for alternatives,
3. Prediction of outcomes,
4. Evaluation of outcomes,
5. Selection

Kuhn's model is similar to Altier's model (1999) which prescribes a five step decision analyses model:

1. Define the decision statement,
2. Establish objectives,
3. Value objectives,
4. Generate alternatives
5. Compare and choose.

This research aims to understand at which level should companies intervene in order to change behaviour. Through training and awareness, companies could provide ‘pre-ammunition’ knowledge to assist individuals make decisions when faced with alternatives.

2.4 Ethical decision-making theory (EDM)

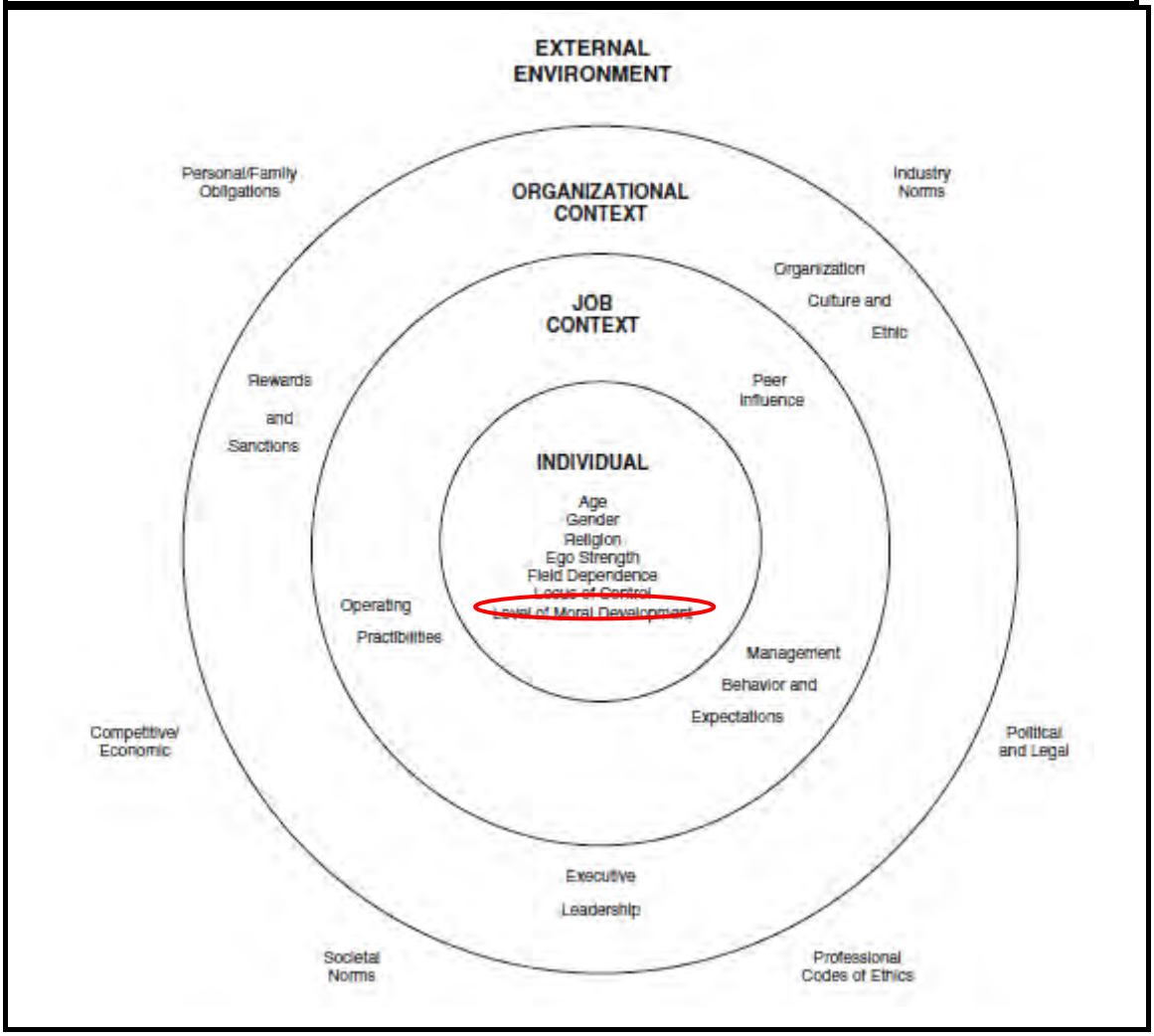
Ethical decision making process is believed different from other processes of decision making. Scholars have described numerous content variables that seek to understand how ethical decisions are made. McDevitt, Giapponi and Trompley (2007) have summarized these variables from literature into a model shown in Figure 2.3 below. They have gleaned from the work of Janis and Mann of 1977.

Some of the individual variables identified by researchers are those indicated in Figure 2.3. This research has mainly focused on the circled level of moral development. Situational variables were grouped into job context, organisational context and the external environment. As indicated by Covrig

(2000), Pelletier and Bligh (2008) also stressed the importance of ethical behaviour role modelling that happens at organisational context.

Many companies are convinced that ethical corporate culture is related to strategic advantage (Harrington, 1991). There are obviously many organisational factors (or means as per appendix 1) that influence employee ethical behaviour. Yin and Douglas (2008) have made a case of reward systems. The researcher only investigated the formal ethics training not the other interventions.

Figure 2.3: Content variables framework source: McDevitt et al, 2007



Salvador and Folger (2009) have shown that ethical decision-making seems to be distinct from other types of decision-making processes. Their argument is based on neuroethics, which is a study of the cognitive and neural mechanisms underlying ethical decision-making. Neuroethics will not be explored any further.

Some ethical decision making models are based on theory or philosophy while others are based on practices. Ethics can be divided in many aspects. These include normative ethics versus descriptive ethics, cognitive versus affective.

2.4.1 Normative versus descriptive (empirical) ethics

Business ethics are commonly divided into two realms (O' Fallon and Butterfield, 2005). The first one is normative ethics which resides largely in the realm of moral philosophy and theology. This is how people are expected to behave (O' Fallon and Butterfield, 2005).

The second one is descriptive ethics which resides in the area of management and business. Descriptive ethics concerns itself with explaining and predicting individuals' actual behaviour (O' Fallon and Butterfield, 2005). This research will focus mainly on descriptive ethical decision-making.

2.4.2 Cognitive (rational) versus Affective (emotional) ethics

Modern psychology has three divisions, the cognitive, the conation and the affective. Cognitive ethics are mainly concerned with the process of thought or information processing, affective ethics are concerned with the way people feel (Litzky and Oz, 2008). The affective domain relates to how individuals feel emotionally and physically while learning. Conation is a term of relatively recent origin that is synonymous with motivation/ will/ drive. Conation was not looked at in this study because of limited literature information.

The researcher has solely focused on the cognitive perspective on ethics. Most literature explores this side as pioneered by Kohlberg in the 1960's. Festinger in 1957 (cited by Logsdon and Yuthas, 1997) proposed a cognitive dissonance theory to explain why people feel uncomfortable when they are expected to act in ways not congruent to their beliefs. Moral disengagement is convincing the self that ethical standards do not apply to you in a particular context (Bandura, 1999).

2.4.3 Teleological versus deontological ethics

Ethics could also be considered from a teleological or deontological point of view or both simultaneously (Beekun, Hamdy, Westerman and HassabElnaby, 2008). Teleological is also known as consequentialism because it judges actions of the agent to be wrong or right depending on the outcome. Deontology on the other hand simply looks at the rightness or wrongness of the action regardless of the consequences (Beekun *et al*, 2008).

Aupperle (2008) argued for the highest moral value rather than focusing on the course of action. He believed that ethical dilemmas have multiple solutions with different consequences. He further said good moral intent could result in bad unintended consequences. Managers are often expected to choose between good moral intent as opposed to good moral outcomes.

There is often no consensus in literature about what is inherently good or bad, thus this research focused more on the teleological view. Criticism about teleological approach is that the agent must be all knowing so that he/she can explore all eventualities (Aupperle, 2008)

There are few studies that have attempted to look at what drives managers between teleology and deontology. As an example, DeConinck and Lewis in 1997 cited in O'Fallon & Butterfield (2005) found that though both are important; deontology influenced sales managers' ethical judgement more than teleological.

2.4.4 Utilitarian versus Eudaemonist

Teleology can be divided into two, utilitarian and eudaemonist. Utilitarian is concerned with the greatest good for the greatest number, while eudaemonist is concerned with maximising happiness (Beekun *et al*, 2008). Eudaemonist ethics are concerned with happiness, pleasure, virtue and excellence. Eudaemonist ethics are sometimes associated with ancient theory (Annas, 1995)

2.4.5 Individual Moral development

Kohlberg is considered by many researchers (e.g. Kay, 1982) as a forerunner in cognitive moral development theory. Kohlberg (1963, 1964 and 1969) proposed a six-stage model of moral development. His theory proposed that individuals develop moral judgement through education and socialization processes (Lovisky et al, 2007).

Kohlberg's (1969, 1976 and 1981) theory of moral development combines moral philosophy with cognitive psychology in asserting that individual cognitive development is a necessary prerequisite for moral reasoning (Logsdon and Yuthas, 1997).

Table 2.1: Kohlberg moral development levels

	Kohlberg levels/categories (basis of decision making)
Pre-convectional	Stage 1: Obedience and Punishment Stage 2: Instrumental purpose and exchange
Conventional	Stage 3: Interpersonal accord, conformity to group norms Stage 4: Social accord and system maintenance
Post-convectional	Stage 5: Social contract Stage 6: Universal ethical principles

Kohlberg's masterpiece is not without criticism.

- Empirical support was only based on his moral judgement scale (Kay, 1982)
- Lack of psychometric properties and standardization (Kurtines and Grief, 1974; Rest, 1975; Rest at al, 1974)

- Little evidence of uniform administration and scoring procedure
- Not fulfilling requirements for stage dependant theory (Kurtines and Grief, 1974). The distinctiveness of the six stages is still questionable. (Kay, 1982)

It was because of these criticisms that James Rest and his associates (known as neo-Kohlbergians) addressed the technical and conceptual problems with Kohlberg's framework (Kay, 1982). Still there were a few flaws that remained and Rest's effort were seen to be lacking on the following:

- Methodological and conceptual grounds (Kay, 1982)
- Not applicable to pre-adolescents (Rest et al, 1978)
- DIT correlated with age – reasoning skills versus moral development (Kay, 1982)
- Covariance with Intelligence Quotient, socioeconomic status, motivation and intellectual interest was thus. Failure to isolate study variables (Kay, 1982).
- DIT only measures verbal reasoning skills (Sanders et al, 1995 cited in Loviscky 2007)

Despite the criticism of the DIT, research evaluating the DIT has found it to be psychometrically sound (Moreland, 1985 & Sutton, 1992 cited in Lovisky et all, 2007).

In 1984 Rest proposed a four-component decision-making model shown in Table 2.2 below. His model is theoretical and is based on Kolhberg's framework (1976) which gives it much credibility. Rest views ethical decision

making as involving four sequential basic steps (O'Fallon and Butterfield, 2005).

The first step is to identify the moral nature of an issue when dealing with a dilemma (Mustamil and Quaddus, 2009). The second step involves the agent making a moral judgement. Moral judgement is a psychological construct that characterizes the process by which people determine that one course of action in a particular situation is morally right and another course of action is wrong (Rest at al, 1997 cited in Lovisky et al 2007). The third step involves establishing a moral intent. The last step involves execution the intent.

According to Cottone and Claus (2000), in 1994 Rest revised his 1984 model to be as per the second column on table below.

Table 2.2: Rest's four steps decision making models

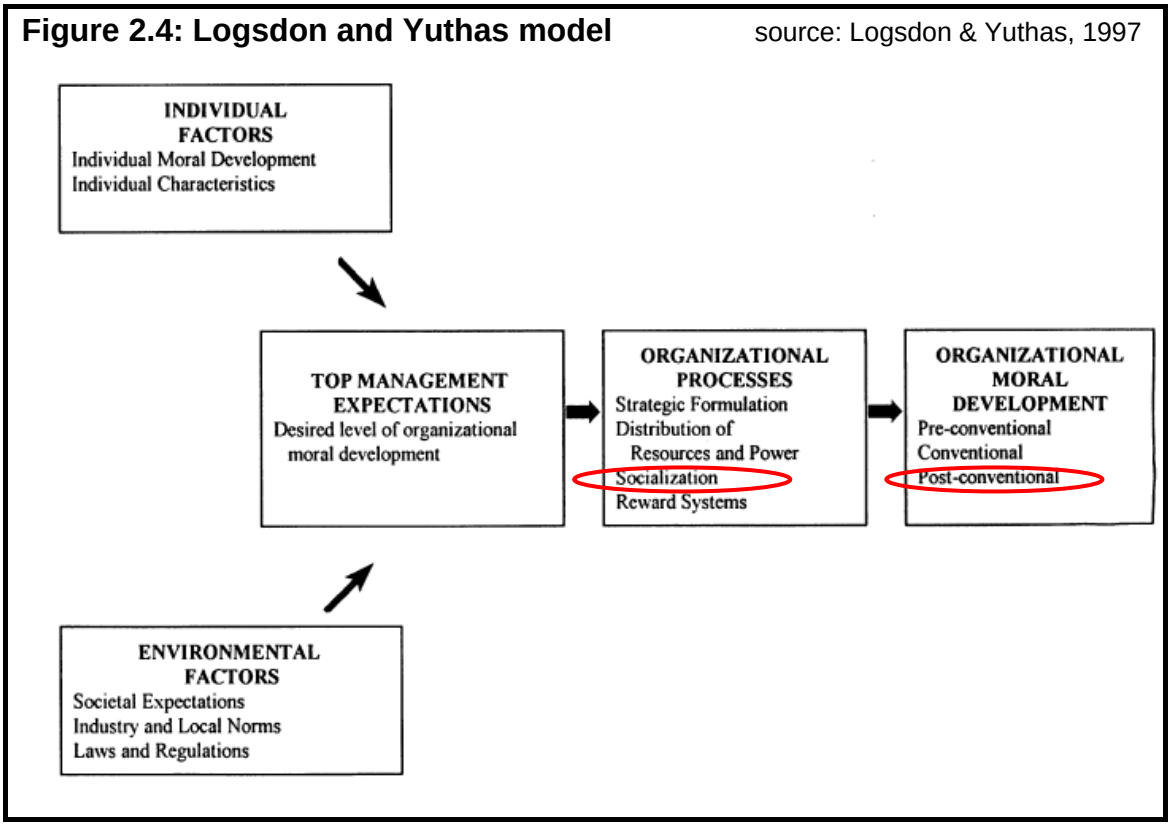
Rest 1984/86 (Model 1)	**Rest 1994 (Model 2)**
Moral awareness	Moral sensitivity
Moral judgement	Moral judgement
Moral intent	Moral motivation
Moral behaviour	Moral character

2.4.6 Organisational moral development

Kohlberg and Rest's work was based mainly on the individual. Logsdon and Yuthas (1997) propose a model that depicts levels of organisational moral development based on the work of Kohlberg (1976). They asserted that organisations do develop morally based on organisations processes. Those processes could include reward systems, strategy formulation and ethical

training. Ethics training could be seen as some kind of socialisation. This enquiry aimed to find out if an organisation process (training) could cause a shift from conventional thinking to post-conventional thinking. Their model can be seen below and many parallels can be drawn between Figure 2.4 and Figure 2.3 above.

Figure 2.4: Logsdon and Yuthas model source: Logsdon & Yuthas, 1997



One of the organisational processes is written code of ethics. Up until the 1950s there was little emphasis on written code of ethics or stated company values (Curry and Thach, 2007). Since the 1950s those issues have gained attention and many companies have done well as revealed by Mathews' classical study cited in Curry and Thach, 2007; and Stevens (2008) study.

Different pictures have been painted to indicate the interaction between individual's decision making and organisation factors. O' Grady (2002) cited White and Lam (2000) who developed a model for ethical behaviour which equates organisational processes to means. Their model can be seen in Appendix 1. They defined 'means' as company's code of ethics, policies, values and procedures. This research will only look at the effectiveness of one element which is formal ethics training.

It was encouraging to note that in recent years, a new concern with ethics training for managers has been raised (e.g. Loviscky, Trevino and Jacobs, 2007). The effectiveness of the training provided is sometimes questionable. Mumford (2008) has provided preliminary results to show that not only that this training has led to sizeable gains in ethical decision making.

The research sought to understand if the current ethics training was adequate to achieve a reasonable post-conventional thinking score (P-score) of 35 in its managers. If the score of 35 was not reached, a review of the training program may be required. The score of 35 was based on a sample of 10553 subjects conducted by the University of Alabama. The average person with a senior qualification would achieve a p-score of 37.84. The number 35 is further justified in chapter three.

O' Fallon and Butterfield's (2005) literature review between 1996 and 2003 has found that moral judgement was proven to depend on the individual factors, moral intensity and organisational factors. They showed that a total of 185

findings related to moral judgment in 174 articles were found as compared to only 28 for awareness, 86 for intent and 85 for behaviour. This fact demonstrates that much attention was given to judgement during this period (1996-2003). Surprisingly though was the fact that there was only one finding related to training's influence on judgement. See Table 2.3 below for summary of their findings in relation for training. The researcher aimed to shed more light on the matter.

Table 2.3: Summary of O'Fallon and Butterfield (2005) findings

Independent variable	**Dependant variable**	**Major Finding**
Training	Awareness / Sensitivity	More training is negatively related to ethical sensitivity
Training	**Judgement**	**Those who completed an ethics course reported significantly higher P-scores.**
Training	Intent / Motivation	none
Training	Behaviour / Character	Training did not lessen legal violations

2.4.7 Practice-based models

Many researchers have developed models based on experience. Cottone and Claus (2000 summarized these models (see Appendix 2). Some of the models borrowed some ideas and concepts from Rest's work. It suffices to say that Kohlberg and Rest's work is still the foundation of many models available today.

Similarly there are models that were developed for specific professions (Cottone and Claus, 2000). These were not examined in detail since this quasi experiment research looked at business ethics in general, for a large organisation where various professions were represented.

2.5 Ethical decision-making (EDM) training

This enquiry aimed to find out if ethical decision making could be trained or not. The researcher looked at various emphases on how and who drive ethics training. The common aim of such training is to improve employee moral decision making (Ritter, 2006; Halbesleben et al, 2005). Though there was an overwhelming consensus on the need of training, but there is limited consensus on the content and the method of training.

2.5.1 Role of business schools

Others have joked by calling business ethics an oxymoron in many business education programs (Gray and Clark, 2002; Sauser, 2004). This may be indicating a huge gap between our traditional understanding of what business is about – 'win at all cost' and what it should be – 'win-win'. The business environment has been called 'an economy of cutthroat competitiveness' (Ritter, 2006)

It has been found that MBA students enrol with noble goals (idealistic ambitions) and graduate with a duty to maximise shareholder value (Gray and Clark, 2002). Global spending on business education was $US2.2 trillion in 2006 (Prinsloo *et al*, 2006). Mintzberg cited in Prinsloo *et al* (2006) called

present graduates of business schools 'mercenaries in the executive suite'. Therefore general business education may not be an answer to minimise corporate scandals.

Ritter (2006) believes that the purpose of teaching business ethics is to increase cognitive competence. Teaching creates moral awareness, understanding, reasoning and tolerance. Others (e.g. Prinsloo et al, 2006; Hartog, 2004) have argued that adult learning has to involve more than just cognitive acquisition of knowledge.

Curry and Thach (2007) call for business schools to teach ethics as a solution to frequent scandals that recurred since the 1950s. They believe that each newsworthy lapse is blamed on lack of ethics in business as a profession. They have rightly pointed out that seldom is the case in public administration, politics, law, religion, or other professions (Curry and Thach, 2007).

An overwhelming agreement that a much greater emphasis on business ethics now exists than it did 20 years ago and that the emphasis on business ethics would continue and be further developed in the future (Curry and Thach, 2007). Premeaux (2009) observed that business scandals did not really impact actual behaviour until the recent Enrol convictions.

2.5.2 Role of ethics courses

Not every manager has been exposed to business school to corrupt them as suggested above. There are also part-time courses that are offered to shape

manager's thinking processes. West and Berman (2004) reported on the work done by US cities to improve their staff moral reasoning. This work was mainly done using short courses.

In a review done by O' Fallon and Butterfield (2005), they cited work done Sparks and Hunt (1998) which did found that more training is negatively related to ethical sensitivity. Their conclusion was in conflict with what Eynon, Hill and Stevens, (1997, cited in O' Fallon and Butterfield, 2005) found. Eynon *et al* (1997) reported that people that completed an ethics course had significantly higher P-scores (moral judgment). Most moral education interventions use DIT as an outcome measure (DIT manual, 2003).

According to this enquiry's model (Figure 3.1), training is expected to impact on both awareness and judgment. The link that was explored was between training and moral judgment.

2.5.3 Role of junior degrees

Sinha, Thomas and Kulka (2007) have proposed that ethics training be integrated to construction engineering curriculum. They believe that social values should be the basis of university ethics instruction. Construction was the second largest industry in the United States at $US3.4 trillion in 2007 (Sinha *et al*, 2007).

Sinha et al (2007) have identified barriers that prevent institutions of higher learning from teaching ethics. Some of the challenges are faculty indifference, student indifference and lack of discipline specific cases studies.

2.5.4 Role of professional continuing education

Some deliberations go to including ethics training as part on normal continuing professional training like engineers (Sauser, 2004; Elder, 2004; Lozano, Paula-Salvador, Gozalvez and Boni, 2006). Some have gone further into designing training for professionals in specific environments e.g. consulting engineers (Elder, 2004). And other than professionals; even some public administration authorities have made ethics training compulsory (West and Berman, 2004).

2.5.5 Ethics training format

Some have argued that the effectiveness of a training program depends on the approach adopted by the company (Harrington, 1991). Organisations could approach their training programs using case study methodologies, guidelines (checklist), frameworks or cognitive moral development. Case study approaches have been found to be the most common and most successful (Harrington, 1991).

2.5.6 Training the right level of seniority

Ethics training is often designed to improve decision making, that is why most companies train their manager's not necessarily hourly workers (Harrington, 1991). Hourly workers or lower levels of organisations usually get exposed to ethics training through awareness campaigns.

Pelletier and Bligh (2008) pointed out that low level employees need to see that their top leaders are attending same courses. Otherwise a perception could arise that different standards apply at different hierarchal levels. Their second point involves training managers to avoid making statements that can be perceived as hypocritical.

Kreie and Cronan (2000) presented a survey results on how companies might influence choices employees make by establishing a code of ethics. They assert that businesses are concerned about the ethical behavior of their employees and the security of their information systems. Therefore, businesses are interested in whether they can influence their employees' decision making process to act ethically. Managers at different levels stand to do more damage in that regard.

2.6 Expected ethics training outcomes

Many organisations resort to teaching their employees as a matter of survival while others see it a strategic advantage (Harrington, 1991). CEO of Borg-Warner once said “values and profits are inseparable”. To strengthen this view, a few authors believe that Johnson and Johnson ethics-credo saved the company during the Tylenol crisis (Harrington, 1991; Logsdon and Yuthas, 1997).

In the cognitive domain, learning outcomes could be classified into the six hierarchical levels (Litzky and Oz, 2008). Those levels are knowledge

(‘*awareness’*), comprehension (‘*awareness’*), application (‘*behaviour’*), analysis (‘*judgement’*), synthesis *(‘judgement’*) and evaluation (‘*judgement’*). The words in brackets are Rest (1984) terminology and were inserted to indicate similarities.

In the affective domain (dealing with emotions), there are five outcome levels (Litzky and Oz, 2008). They are receiving, responding, valuing, organization and characterization (Krathwool, Bloom, & Bertram, 1973 cited in Litzky and Oz, 2008). To summarise, the expected training outcomes are both at the cognitive level and emotional level. This research will only measure results at a cognitive level.

2.7 Ethics training criticism

Below the researcher summarises ethics training criticism offered by various authors. There are six main criticisms of ethics training; difficult to measure change, pluralistic ignorance, it competes with mainstream business education, too much training is bad, it doesn’t develop the whole person and lacks emphasis on action. With the criticism, authors suggest possible solutions or further theories as shall be discussed below.

2.7.1 Measuring ethics

Some critics of business ethics training on the other hand have asserted that it is difficult if not impossible to determine whether employees have become more ethical or not (Litzky and Oz, 2008). It is believed that including teaching

methods that use affective (emotions) domain principles can help to measure outcomes such as improved decision-making (Litzky and Oz, 2008).

2.7.2 Pluralistic Ignorance prevails

Halbesleben, Wheeler and Buckley (2005) have ascribed the apparent failure of ethics training to Pluralistic Ignorance (PI). They define Pluralistic Ignorance as ineffective decision making in ethical situations because of misperception regarding others' ethical standards. Their solution is to provide frame of reference (FOR) training to help individuals to form prototypes of good and bad behaviour.

2.7.3 Too much of a good thing is bad

As shown above Sparks and Hunt, 1998 cited in O' Fallon and Butterfield (2005) found that too much training could have opposite effects. Too much awareness can make people oblivious.

2.7.4 Ethics training competes with mainstream business education

One strong view expressed was that ethics training comes head-on with traditional business education (Gray and Clark, 2002; Sauser, 2004; Ritter, 2006). Business ethics should not be seen as an oxymoron. They believe the two could complement each other; hence Curry and Thach's (2007) call to business schools to teach ethics as a solution.

2.7.5 Current training does not develop the whole person

Prinsloo, Beukes and de Jongh (2006) have criticised the traditional way of learning. They see it as superficial and lacking depth. They have argued for a whole person learning approach.

2.7.6 It is too prescriptive and lacks focus on action

Anthony (1988) cited in Hartog (2004) has criticised the prescriptive educational endeavours. Hartog (2004) attempted to build a case for allowing students to guide lecturers. She asserts that grappling with real work-based dilemmas was central to the practice of action learning. Even Defining Issues Test moral dilemmas (cases) have been modified for a specific profession (Thorne 2000 cited in Ho and Lin, 2008).

2.8 Chapter summary

Theoretical constructs discussed above were summarised in Appendix 3 using Yin's (2002) groups of theory. The structure of literature review started from a high level view to the low level detail following the form of a funnel (see Figure 2.1). It started from decision making theories to training practices and outcomes. Ethics training criticism was also looked at and summarised.

In conclusion, literature review has shown that there are mixed messages (as summarised in Table 2.4 below) about the effectiveness of ethics training interventions. This conflict lands itself to the question of effectiveness of the training provided raised in Chapter one.

For the purposes of this study, the researcher will only look at employees' ethical decision-making judgement (i.e. part 2 of Rest's framework). The assumption made was that actual behaviour can only be observed in practice using a simulated test.

Table 2.4: Can ethics be trained literature review summary

Ethics training makes a difference / improves p-score	Ethics training doesn't make a difference / has the opposite effect
• O' Fallon and Butterfield, (2005) – Eynon, Hill, & Stevens in 1997	• O' Fallon and Butterfield (2005)- Sparks and Hunt in 1998 • Gray and Clark, 2002 • Hartog, 2004 • Sauser, 2004 • Halbesleben, Wheeler and Buckley (2005) • Prinsloo et al, 2006 • Ritter, 2006 • Litzky and Oz, 2008

3. Research hypothesis

3.1 Introduction

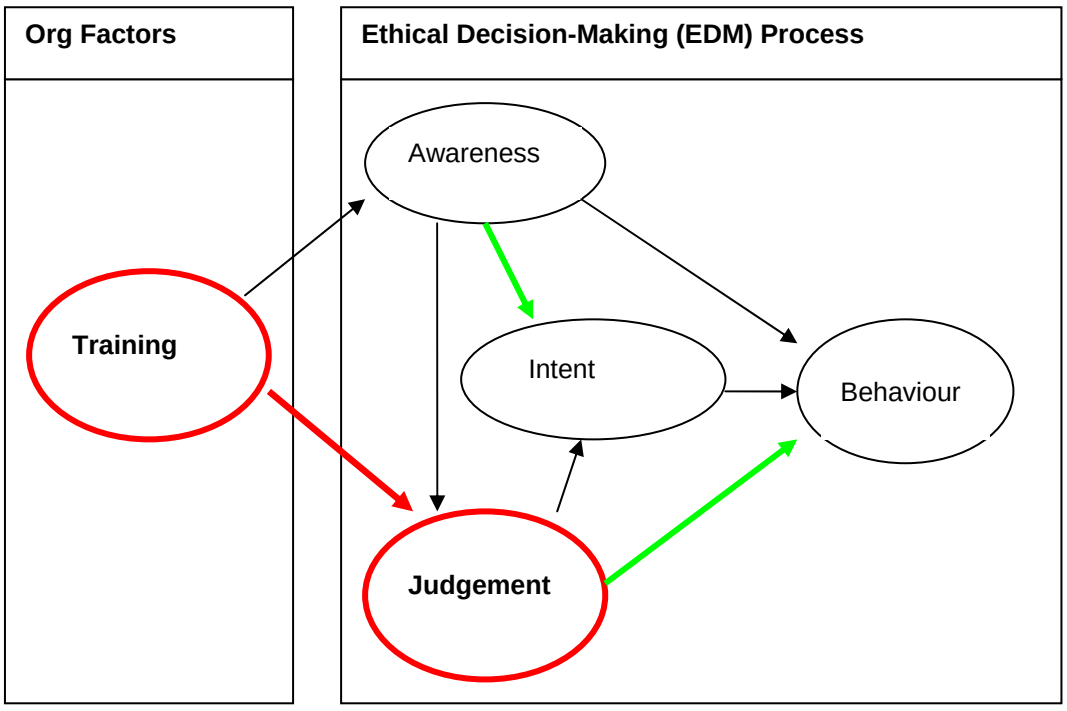
The quasi experiment focused on testing two hypotheses around post-conventional reasoning. Those hypotheses are described below.

3.2 Research Model

Cottone and Claus (2000) model review indicate other approaches to modelling ethical decision making. They cite Guthel, Bursztaijn, Brodsky and Alexander who proposed a Probabilistic, Decision Analysis and Conscious Gambling concept in 1991. Guthel *at al* (1991) argued that decision-making must account for some level of uncertainty.

Based on the arguments discussed above, the research model will be as follows.

Figure 3.1: This research's initial Model



Legend: **Adapted from: Mustamil and Quaddus 2009**
Red = this research
Black = link proven elsewhere
Green = still to be proven

3.3 Hypothesis 1

As seen in Chapter two above, several results have been reported where completing the ethics training significantly improved the participants P-scores. The P-score refers to post conventional thinking and mainly refers to a higher level of moral reasoning. Therefore the first hypothesis that was tested was aimed at comparing the means of the experimental and control group.

The null hypothesis was that the mean of scores of the trained group (experiment group) was the same or less that of the untrained group (control

group). The alternative hypothesis was thus: the mean P-score of experimental group will be higher that of control group.

H_o: $\mu_{tr} - \mu_{utr} \leq 0$

H_1: $\mu_{tr} - \mu_{utr} > 0$

Where:

μ_{tr} = trained managers

μ_{utr} = untrained managers

H_o = Null hypothesis

H_1 = Alternative hypothesis

3.4 Hypothesis 2

Effective training by definition had to move participants' moral judgement to significant levels in absolute terms, not just relative movement compared to the control group. In organisations were moral reasoning is quiet low; it could be easy to show significant improvement on post-conventional scores without having a matured organisation. As a result some kind of benchmarking was necessary.

Based on the company's top management expectation, the mean or median of the trained group should increase to at least P-score of 35. In order to get a sense of the score of 35, three benchmarks have been used.

3.4.1 Averages p-scores from DIT database

For the first comparison, the researcher used p-score values from a Bebeau and Thoma (2003). The score of 35 was below an average p-score of someone with a senior qualification as seen on Table 3.1 below (Bebeau and Thoma, 2003).

Table 3.1: Extract from DIT-2 schema scores per level of educational

P-score	N (sample size)	Educational level
33.13	667	Grade 10-12
32.19	111	Vocational / tech
31.06	236	Jr. College
34.45	1333	Junior
35.00 (target)	**30 (target)**	**Zola Mining (target)**
37.84	2441	Senior
41.06	853	MS Degree
44.87	1582	Professional degree

Source: Adapted from Bebeau and Thoma (2003)

3.4.2 Average p-scores from Vitton and Wasonga study

On the second benchmark, the researcher used p-score values from a study performed by Vitton and Wasonga (2009). Vitton and Wasonga (2009) compared their average to a study done by Rest and Narvaez in 1994. See Table 3.2 below.

Table 3.2: P-score comparison with previous studies	
P-score	**Group**
62.2	Moral philosophy and political science graduate students
58.8	Liberal protestant seminarians
52.2	Law students
50.2	Medical students
49.2	Practicing physicians
47.2	Dental students
46.3	Staff nurses
42.8	Graduate students in business
42.3	College students in general
41.6	Navy enlisted men
40.0	Adults in general
38.9	Vitton & Wasonga 2009 study
35.0	**Zola Mining (Target)**
31.8	Senior high school students
23.5	Prison inmates
21.9	Junior high school students
18.9	Institutionalised delinquents
Source: Adapted from Vitton & Wasonga, 2009	

3.4.3 Taiwanese accounting students

Most of these scores are based on United States respondents. As national culture can not be ignored (Ho and Lin, 2008), the researcher looked at a p-score proxy from a non-US sample.

Table 3.3: US and Taiwan accounting students p-score			
P-score	**United States N= 223**	**Taiwan N=449**	**South Africa N=30 (target)**
Mean	43.22	**35.37**	Future work
Standard deviation	13.07	12.89	Future work
Median	43.33	33.33	Future work
Source: Adapted from Ho and Lin (2008)			

3.4.4 Hypothesis 2 statement

The null hypothesis was that the mean score of trained managers will be below 35. The alternative hypothesis was that the mean was at least 35.

H_o: $\mu_{tr} < 35$

H_1: $\mu_{tr} \geq 35$

Where:

μ_{tr} = trained managers

H_o = Null hypothesis

H_1 = Alternative hypothesis

4. Research methodology

Any chosen research methodology must fit the purpose of the research. The purpose of the research was to test the effectiveness of a particular ethical training or the hypothesis as described in chapter three. Chapter two has clearly shown that there is sufficient theory based for ethical decision making training to allow researchers to venture into empirical data.

In order to achieve research objectives, a quasi experiment was conducted using Zola Mining. A fictitious name was used to protect the company which has generously allowed the researcher to perform a quasi experiment on its people.

4.1 Zola mining brief introduction

The fictitious organisation will be called Zola Mining and no references will be used when referring to it. Zola Mining was founded in the 1960s. It was listed on the Johannesburg Stock Exchange (JSE) in the mid 1980s.

The company has mining facilities in South Africa and employs over 45 000 employees. Zola Mining contributes about R75 billion, or 4%, to South Africa's gross domestic product (GDP). About 65% of the company's revenue comes from exports. Zola Mining has a drive to be a global player on several markets. It aspires to be a company driven by its values and thus has drawn code of ethics and values statements.

4.2 Beginning of trouble

Firstly, upon receiving allegations on few incidences of corruption, Zola Mining embarked on several voluntary independent investigations. Secondly, it instituted compulsory on-line ethics awareness which mainly focused on compliance with competition laws for its managers. Thirdly, it introduced whistle-blowing channels for employee to safely report any wrong-doing. Lastly Zola Mining trained its senior managers and its ethics officers. Such an organisation was found suitable to evaluate if training meant the end of its troubles.

4.3 Research design

As this research looked to evaluate company specific training intervention and there was no existing data, primary data was thus collected. Research design/plan parameters (data collection, population and sampling, etc) are described below.

4.3.1 Data collection method defended

Data was collected using a self-administered written proprietary test called the Defining Issues Test (DIT-2) version 3.1. Several scholars (e.g. Reidenbach and Robin, 1988, 1990; Lin and Ho, 2008; Nguyen, Basuray, Smith, Kopka and McCulloh, 2008) have used Multidimensional Ethics Scale (MES) to measure ethical decision-making attitudes. Beeken et al (2008) have used Reidenbach and Robin's multi-philosophy 1988 instrument. Robinett (2008) asserts that

empirical evidence have demonstrated validity and reliability Moral Judgement Test (MJT).

The first reason the DIT tool was found to be appropriate for this research as opposed to MES and other instruments was because they take a lot of time to complete. It could have discouraged subjects from responding thus making response rate very low. DIT-2 is shorter and thus quicker to complete and yet it offers reliable results. It takes between 30 and 45 minutes to complete.

The second major reason of selecting the DIT was the fact that it was largely used by researchers; consequently there were a lot of comparable results (p-scores). Thirdly, DIT was validated and was found to be reliable, see Table 5.2.

Once the participants of the two groups have been identified, the DIT-2 instruction sheets and answer sheet were sent using internal mail to different company sites across the region. Two weeks were given for the respondents to complete the self administered test. Some of the days coincided with South African school holidays, but the chosen window made it possible for people who took one week leave to still participate. Respondents could chose to mail back the answer sheet or to scan it and email it back to the researcher.

Vitton and Wasonga (2009) have also confirmed that the DIT has passed the seven criteria for validity and reliability (see Table 5.2 also). Loviscky, G.E., Trevino, L.K & Jacobs, R.R. (2007) have made similar conclusions. Therefore

the Rest (1997) Defining Issues Test (DIT-2) will be used to evaluate both samples.

4.3.2 Benefits of a test over an interview

Respondents tend to misrepresent facts when asked about moral issues. Response error or bias could have been a serious treat to the quality of the results. To overcome such limitations, proprietary tests (e.g. MJT, DIT) were developed.

Such tools were designed to test for moral reasoning without offending the subjects. Secondly, they are designed to check for the validity of responses given. The DIT for an example has rigorous checks to ensure reliability of the responses received from participants (Robinett, 2008).

4.3.3 History of DIT

Based on Kohlberg classical theory, the DIT has a long history. As result of criticism and on going research, there are two forms of DIT i.e. DIT-1 and DIT-2. Bebeau and Thoma (2003) cite a comparison between DIT-1 and DIT-2 done by Rest, Narvaez, Thoma & Bebeau (1998). DIT-1 has a longer history and hence a lager database for comparison purposes.

DIT-2 is more up-to-date and had more than 13 000 subjects in 2003. Other advantages of the DIT-2 are the fact that it is shorter, has more stream lined

instructions, it purges fewer subjects for unreliability while not sacrificing validity.

4.3.4 DIT design

The DIT-2 uses scenarios to evaluate respondent's ability to make post conventional ethical decisions. The use of scenarios is still a popular method. O' Fallon and Butterfield (2005) have found that 55% of the 174 studies reviewed used a scenario method. They do however encourage creativity in this area to come up with effective means to measure behaviour (step four of Rest's model) rather than intent (step three). To put respondents through a simulated scenario was considered but would be challenging given the time and budget constraints of this project.

The DIT-2 has only five scenarios that respondents need to respond to. The first scenario is called the famine. It is about a starving man having to decide to steal from a hoarding rich master. The second scenario is about a reporter that has to decide either to print a damaging story about a political figure.

The third one is about a school board. The fourth case is about a doctor who is expected to decide whether to give a patient an overdose of painkillers or not. The last scenario is about students demonstrating on a foreign policy. See Appendix 4 for scenario details.

4.4 Population and sampling

Since this report was a quasi experiment research the population was the company's employees who met the following criteria.

- Resided in South Africa
- Held a managerial position

For sampling purposes at least 30 people per group were sought to fulfil the central limit theorem. No particular stratification was pursued; hence the sample would be non-probable.

The first group would be those that have gone through the formal ethics training between March 2008 and July 2009. A list of trained participants was provided by the organisation. The total number of participants was 50, thus the limit of people who could be sampled. Some people have left the company while others were based on overseas offices. Hence the DIT-2 test hardcopies were sent to only 40 participants.

On analysing the leaders that were trained, the researcher noticed that firstly they were spanning a across two organisational levels i.e. D & E. The second observation was that they were older than 35 years. The third characteristic of the trained group was that they were spread across all functions of the company.

The second group will be employees that have not gone through the formal ethics training. They were selected in a targeted manner from a list obtained

from Zola's Microsoft Outlook database in order to achieve a level of matching between group one and group two. The characteristic of the two groups has to be similar.

To eliminate some nuisance variables between the two samples, the two groups were controlled by selection to be a homogenous as possible. This means the company level mix had to be similar, male and females mix had to be similar. In order to achieve matching the test were only sent to 45 of untrained leaders, while their total is around 2000.

Table 4.1: Groups matching

Experiment group characteristics	**Control group to match**
Total number = 50 People legible for sampling = 40 Female = 6 Organisational levels D&E Older than 35 years Good spread across different business units Educational level: Senior qualification to MS degree	Total number = 2000 People legible for sampling = 45 Female = 5 Organisational levels C to E Older than 27 years Good spread across different business units Educational level: Senior degree to PhD

4.5 Quality control

To ensure that the respondents understood of what was required of them, a letter of introduction was sent together with the DIT-2 test package.

In order to improve the response rate, an introduction email was sent out a week before. The introduction email informed participants about the purpose of the research, confidentiality and that participation was voluntary. Non-response

bias was expected because the participants where not induced in anyway. The implications of non-response bias could be the fact that those that responded don't represent those that did not respond. In such a case there will be unrepresented people on the analysis.

The filled answer sheets were sent to the University of Alabama for scoring and basic descriptive analysis. They have measurers as shall be discussed in chapter five to ensure that data was reliable.

Many studies use students as their subjects because of convenience. The interpretation of such results needs to be taken with a pinch of salt (Beekun *et al*, 2008). The researcher did not collect any data from students which should make generalisation to business sounder.

4.6 Confidentiality

Researching on business ethics was found to be a sensitive issue. Before participants could warm up to the idea, they had to be assured of confidentiality. Confidentiality was ensured by using identity numbers on the answer sheet instead of participants' names. Everything followed from the answer sheet with no mention of any subjects' name. Only aggregate DIT scores will be analysed and reported not individual scores.

4.7 Unit of analysis

The unit of analysis for this research was the individuals because the inquiry was concerned with the impact the offered training had on an individual. Statistical analysis was performed to test the hypothesis developed in chapter three.

4.8 Assumptions

In order to perform statistical analysis on any data, certain assumption needs to be made. Firstly, the data was assumed to conform to some kind of normality. Secondly, arithmetic operations on the data were meaningful.

4.9 Data Analysis

Data analysis was done by the University of Alabama. The test answer sheets were scanned and analysed by a computer. The computer scored individuals schema scores (stage 2/3, stage 4, etc.). They performed the combined group descriptive analysis. They also perform data cleansing to eliminate unreliable respondents. Sub-group analyses were done by the researcher to prove or disprove the hypotheses.

4.10 Research limitations

In interpreting the research results, several limitations should be noted. The first one was inherent in the design was the choice of people that would be trained. The quasi experiment approach does acknowledge such a limitation.

People that attended the training did so because of the position or have been appointed as ethics officers. The selection was not random at all.

Secondly, the research was only limited to South Africa. Few previous studies (Rottig and Heischmidt, 2007; Beekun, Hamdy, Westerman and HassabEnalby, 2008; Ho and Lin, 2008; Hamilton, Knouse and Hill, 2009; Mustamil and Quaddus, 2009) have indicated that national culture could not be ignored in studying moral development. It would have been interesting to see if there was a difference between people in different regions of the world and those that are in South African working for the same organisation.

Thirdly, the research was only done with one South African company. The training service provider provides it to several organisations in the country. It could have been interesting to explore if different companies could show different results.

DIT manual has indicated that English being the primary language has a significant impact on how respondents understand moral dilemmas presented on the test.

5. Results

5.1 Introduction

In this chapter sample characteristics, reliability, validity and results will be presented. The results will be firstly presented in a combined format and later per hypothesis. Raw data is shown in Appendix 5. Discussion around findings will be addressed in chapter six.

5.2 Sample characteristics

A total of 85 people were asked to participate in the research. A response rate of 24% was obtained. The 21 responses were sent to the University of Alabama for scoring and basic analysis. Using various validity checks three data points were purged leaving 18 points for further analysis. The higher response rate could be attributed to the following measures that were put in place:

- An email was sent before the time to pre-warn the participants that a hard copy test was on its way.
- Hard copy provided additional sense of confidentiality. With electronic survey subjects tend to doubt confidentiality.
- A dedicated Zola staff member was tasked to make follow ups. Since the participants were senior people in the organisation, their PA's were utilised to ensure that feedback was received in time.

Lastly the DIT-2 takes a reasonable amount of time. Longer questionnaires tend to deter respondents.

Table 5.1: Response rate and valid data

	Population	Sampled	Responded	Response rate	Valid data
Control group	2000	45	15	33%	13
Trained group	50	40	6	15%	5
Total		**85**	**21**	**24%**	**18**

5.2.1 Age

Their average age was 43.2 with a minimum of 27 years old and the oldest being 64 years old. As we will later explore, age has some impact of moral reasoning.

5.2.2 Gender

It was still a man's world at Zola Mining. Mining companies have traditionally being dominated by males. On the experiment group, six females were legible. As a result only five females were asked to participate on the control group (see Table 4.1). On both groups females did not respond to the questionnaire.

5.2.3 Level of education

Two people (11%) had a senior qualification. Nine respondents (50%) had a professional degree. Six people (33%) had a Masters degree while only one person (5%) had a PhD.

5.3 Scale results

The p-score scale ranges from 5 to 95. Since there is no absolute zero, the scale is interval. An interval scale not only arranges values according to their magnitude but also distinguishes this ordered arrangement in units of equal intervals (Zikmund, 2003).

The p-score and N2 score are highly correlated and are redundant with each other (Bebeau and Thoma, 2003). The N2 score was adjusted so that it is on the same scale as the p-score (Bebeau and Thoma, 2003).

5.3 Reliability and validity checks

The University of Alabama has introduced new checks to eliminate bogus data. The first check is called rate-and-rank consistency. This check is aimed at eliminating respondents that consistently rated and ranked items differently. It is expected that respondents rate and rank issues consistently. Values above 200 are thus purged. See page 4 of Appendix 5. Coefficient alpha is normally 0.73 (pg32 of Bebeau and Thoma)

The second check is called meaningless items. These are items in the questionnaire that contain usual, pretentious words or complex syntax, but aren't meaningful to the dilemma. If the respondent chooses many of these items, he/she is probably responding to the style of wording rather than meaning. Values above 10 are thus purged. See page 4 of Appendix 5.

The DIT test does allow subjects to leave few items blank; however missing data points should not exceed an established threshold. If such a threshold is exceeded the subject was not considered for further analysis.

The last check is called non-differentiation of rates or ranks. It checks if respondents have not rated or ranked all questions the same. Non-differentiation is only tolerated in dilemma.

Validity for the DIT has been assessed in terms of seven criteria (DIT manual, 2003).

Table 5.2: Seven criteria for validity

Criteria	**Key findings**
1. Differentiation of various age/ education groups	30% to 50% of variance of DIT scores is attributed to the level of education.
2. Longitudinal gains (10 years)	College has the most dramatic effect on DIT scores
3. Cognitive capacity	DIT is significantly related to cognitive capacity measures of moral comprehension
4. Sensitivity to moral education interventions	50 interventions showed moderate gains for dilemma discussion and little gain for group's comparison.
5. Link to pro-social behaviours	DIT is significantly linked to many pro-social behaviours and to desired professional decision making.
6. Link to political attitudes	DIT has significant link to political attitudes and political choices.
7. Reliability	Cronbach alpha is in the upper 0.70s and low 0.80s. Test-retest is about the same.

5.4 Respondents' combined results

Zola Mining was found to be below the 2003 DIT benchmark in most schema scores except for maintaining norms (stage 4). These differences could be superficial as there was no statistics that were performed on them because they are not core to the research question. Level of education is one of the comparable parameters in the DIT database (DIT manual). The comparison was done for three educational levels; senior qualification, professional degree and MS degree.

Figure 5.1 Zola Senior qualification compared to benchmark

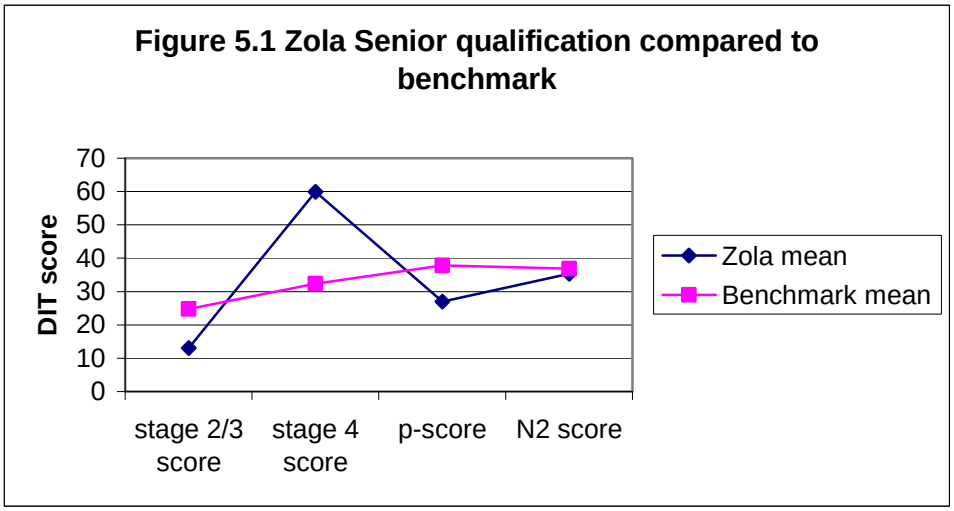


Figure 5.1 depicts a moral schema company's average manager with a senior qualification.

The 2003 DIT stage 4 average score was only 32.4 while Zola's average was 60 for people with senior qualification (n=2). No conclusions could be drawn since the number of observations was low. Similar observations could be made about the other levels of education. See Figure 5.2; 5.3 and 5.4 below.

Figure 5.2 Zola MS degree compared to benchmark

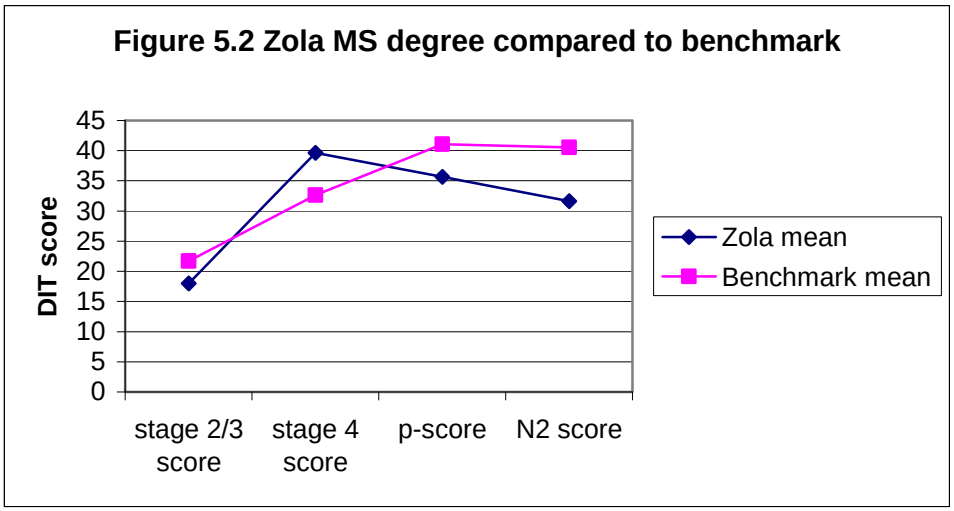


Figure 5.2 depicts a moral schema of Zola's average manager (n=6) with a master's qualification.

Figure 5.3: Zola Professional degree compared to benchmark

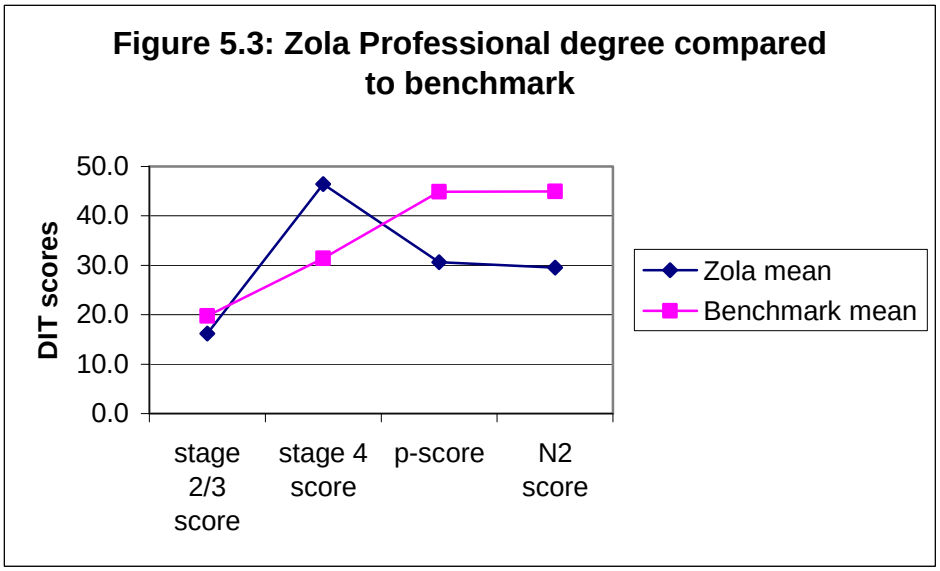
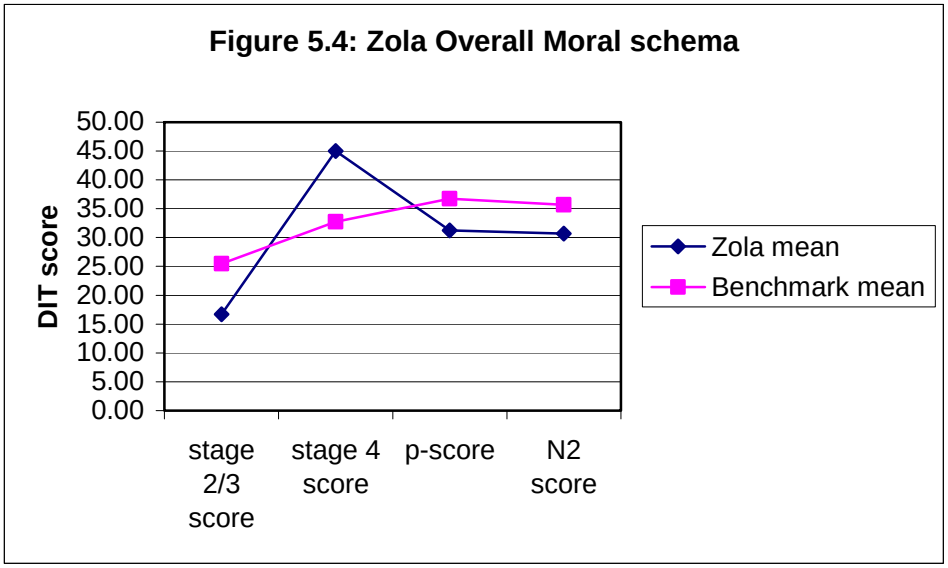


Figure 5.3 depicts a moral schema of Zola's average manager (n=9) with a professional degree.

Figure 5.4: Zola Overall Moral schema



Overall an average Zola Mining manager (n=18) was found to be consistently stronger than the benchmark on stage 4 scores. A similar study was done on nurses by de Casterle', Izumi, Godfrey and Denhaerynck (2008). They found that a stronger stage 4 (conformist culture) does hinder people from doing what is good for the stakeholders.

5.5 Descriptive statistics

Hypothesis testing landed itself on quantitative analysis. Student version of NCSS 2007 was used. The purpose of these statistics is to compare the trained group against the untrained group.

Table 5.3: Descriptive statistics				
	Mean	**Standard Deviation**	**Minimum**	**Maximum**
Age in years				
Control group (n=12)	39.8	8.42	27	54
Trained group (n=4)	53.5	11.09	39	64
Total (n=16)	43.2	10.7	27	64
Stage 2/3 score (personal interest)				
Control group (n=13)	16	8.37	6	32
Trained group (n=5)	18.44	8.76	10	30
Total (n=18)	16.68	8.29	6	32
Stage 4 score (maintaining norms)				
Control group (n=13)	42.77	11.56	20	54
Trained group (n=5)	50.78	20.11	26	68
Total (n=18)	44.99	14.25	20	68
Post convectional score (p-score)				
Control group (n=13)	32.3	11.01	18	48
Trained group (n=5)	28.38	11.80	15.91	42
Total (n=18)	31.22	11.03	15.91	48
N2 score				
Control group (n=13)	28.62	10.14	14.06	47.35
Trained group (n=5)	35.99	9.93	23.42	48.66
Total (n=18)	30.67	10.36	14.06	48.66

Note: The sample size is only 16 on age description because some respondents did not indicate their age.

5.6 Groups comparisons per moral development stage

In this section trained group will be compared to the control group. Figure 5.5 compares an average moral schema of trained managers with untrained managers. On all measures except for post-conventional thinking, the trained Zola employees had higher score than the control group. However the post conventional (p-score) thinking is the most important parameter. To find out if there is something to be concerned about, more sophisticated statistical analysis was performed in section 5.7.

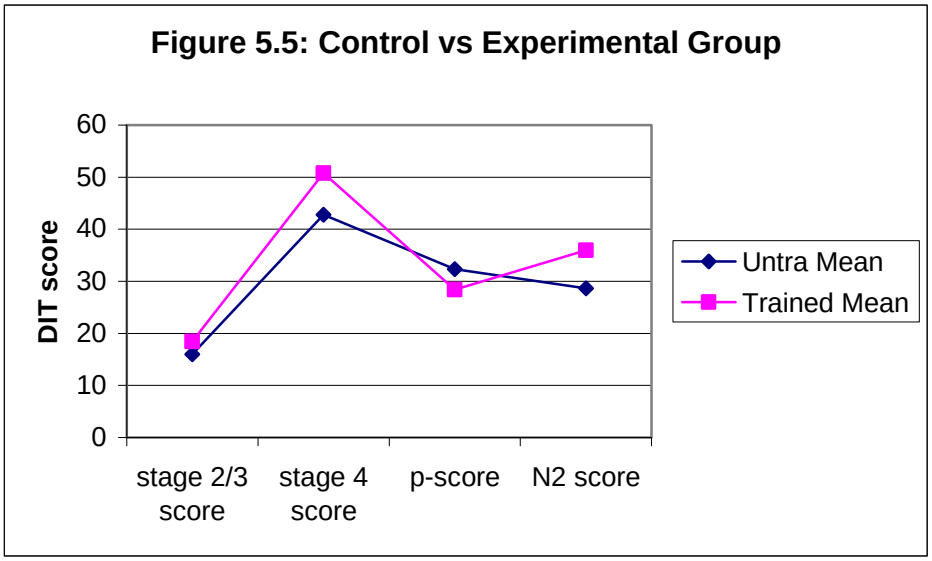
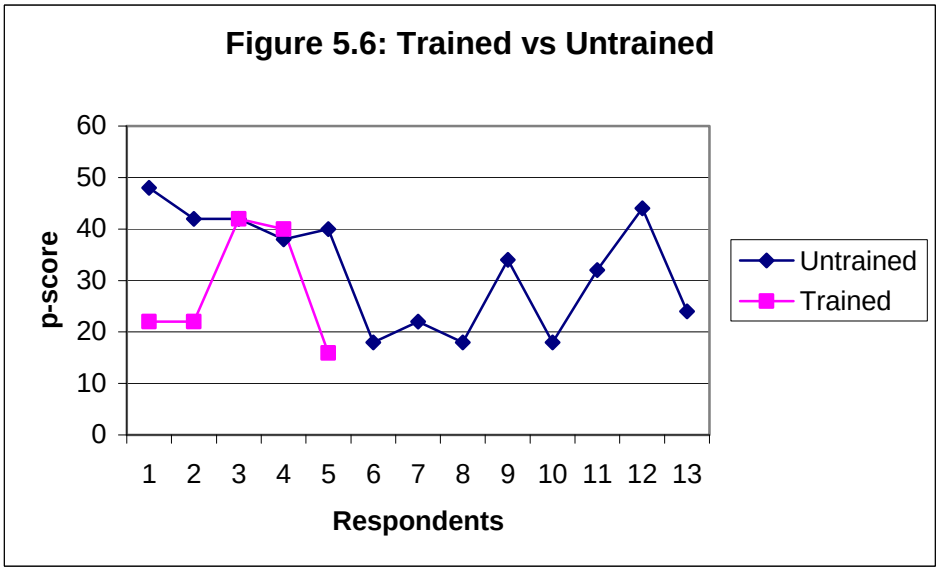


Figure 5.6 shows p-score per individual while comparing the two groups. From this high level analysis we expect the means /medians to be very close.



5.7 Hypothesis 1 Results

As stated in chapter three, the first hypothesis was that an average trained leader will show higher level of moral reasoning than his untrained colleague. Hypothesis testing could be done using different types of tests. The choice of test is mainly governed by the number of samples and the size of those samples. This hypothesis has two independent samples, thus two subgroups analysis lands itself to a T-test.

Below is an extract from NCSS report. The full report could be seen in Appendix 6.

Tests of Assumptions Section

Assumption	Value	Probability	Decision(.050)
Skewness Normality (Untrained)	-0.3179	0.750569	Cannot reject normality
Kurtosis Normality (Untrained)	-2.0507	0.040295	Reject normality
Omnibus Normality (Untrained)	4.3065	0.116109	Cannot reject normality
Skewness Normality (Trained)	0.0000		
Kurtosis Normality (Trained)		1.000000	Cannot reject normality
Omnibus Normality (Trained)			
Variance-Ratio Equal-Variance Test	1.1495	0.760315	Cannot reject equal variances
Modified-Levene Equal-Variance Test	0.0258	0.874435	Cannot reject equal variances

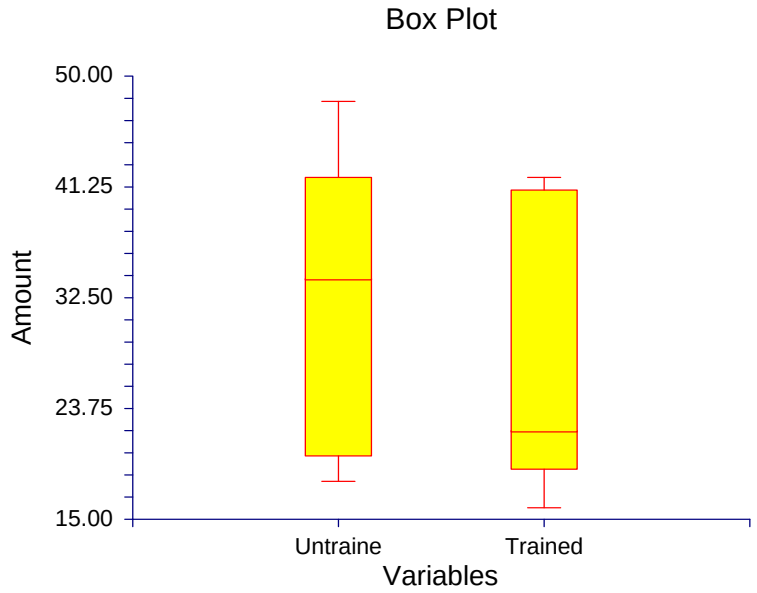
Firstly, the NCSS assumptions section above shows that normality could not be unconditionally accepted. Secondly, the sample size five (trained) led the researcher to treat this test as non-parametric. The third check is equal-variance. As show above, equal variance could not be rejected thus Mann-

Whitney U test was used. Median statistics were appropriate and are show below. A box plot for this hypothesis is also shown in Figure 5.10.

Median Statistics

Variable	Count	Median	95.0% LCL of Median	95.0%UCL of Median
Untrained	13	34	18	42
Trained	5	22		

Figure 5.7: Hypothesis 1 Box Plot



Pictorially the box plot shows that the null hypothesis can not be rejected. Approximation without correction was used. Looking at the Mann-Whitney U test results below reading the first line, the probability value is greater than alpha.

	Approximation Without Correction		
Alternative Hypothesis	**Z-Value**	**Prob Level**	**Reject H0 at .050**
Diff<>0	**-0.6947**	**0.487253**	**No**
Diff<0	-0.6947	0.756374	No
Diff>0	-0.6947	0.243626	No

Therefore the null hypothesis can not be rejected with a 95% confidence level. That means there is no statistical difference between medians of experimental group and control group. The post conventional scores of trained and untrained managers are the same.

5.8 Hypothesis 2 Results

The second hypothesis aimed to prove that ethics does not only between differentiate trained and untrained staff but it provides significant improvement in absolute terms. For this type of testing a one sample T-test was appropriate. The assumptions section showed that normality can't be rejected within a 95% confidence level, but the sample size was so small that nonparametric test was appropriate.

Assumption	**Value**	**Probability**	**Decision(.050)**
Skewness Normality	0.0000		
Kurtosis Normality		1.000000	Cannot reject normality
Omnibus Normality			
Correlation Coefficient			

Wilcoxon Signed-Rank Test for Difference in Medians was looked at.

	Exact Probability		Approximation Without Continuity Correction		
Alternative Hypothesis	**Prob Level**	**Reject H0 at .050**	**Z-Value**	**Prob Level**	**Reject H0 at .050**
Median<>35	0.278517	No	1.2191	0.222801	No
Median<35	**0.139259**	**No**	**-1.2191**	**0.111400**	**No**
Median>35	0.912223	No	-1.2191	0.888600	No

Reading the second line indicates that the p-value (0.11) is greater than alpha (0.05). Therefore the null hypothesis could not be rejected with a 95% confidence. The alternative hypothesis was therefore rejected.

6. Discussion of Results

6.1 Introduction

In this chapter the researcher will discuss the results presented in chapter five in terms of the two hypotheses. In both hypotheses the status quo could not be rejected which presents huge challenges for Zola Mining and interested institutions.

6.2 Hypothesis 1 discussion

Results presented have shown that there was no statistical significant difference between the control group and the experiment group. Therefore, there was no difference in moral reasoning between people that attended ethics training and those that did not. In terms of the research topic, it meant that ethics training offered to Zola Mining was not effective. The research question has been answered. The first hypothesis finding was inline with most literature reviewed as was shown in Table 2.4.

In chapter five we showed that Zola Mining was predominantly a stage 4 company. A similar study on nurses by de Casterle', Izumi, Godfrey and Denhaerynck (2008) showed that a stronger stage 4 (conformist culture) does hinder people from doing what is good for the stakeholders. It is when stage 4 score is low that p-score improves.

6.2.1 Training can be too much

On a review done by O' Fallon and Butterfield (2005) cited work done Sparks and Hunt in 1998 which indicated that more training is negatively related to ethical sensitivity. The researcher could not assert that Zola Mining offered excessive training to its leaders. The managers that were sampled only attended the course once for a period of five days. Therefore more training could not be deemed as a possible cause.

As shall be addressed in 6.2.6 below, emotions could hinder people from welcoming ethics training. Zola Mining should consider doing an 'emotional audit'. A study done by Pelletier and Bligh (2008) revealed a list of possible employee emotions.

6.2.2 The role of general business education

We should revisit the role general business education is playing. Gray and Clark (2002) have found that MBA students enrol with noble goals (idealistic ambitions) and graduate with a duty to maximise shareholder value. They concluded that generic business education may not be an answer to minimise corporate scandals.

6.2.3 Critical action learning - education with a difference

Anthony (1988) cited in Hartog (2004) has criticised the prescriptive educational endeavours. Hartog (2004) attempted to build a case for allowing the students to guide lecturers. She asserted that grappling with real work-

based dilemmas was central to the practice of action learning. Revans is considered the founding father of action learning. He began his work in the 1940s challenging the effectiveness of traditional teaching methods (Hartog, 2004).

Revans encouraged managers to work together in small groups which became know as learning sets (Hartog, 2004). In such groups participants could reflect on their work problems and through questioning new insights could be developed. Revans learning equation was L (learning) = P (programmed knowledge) + Q (questioning insight).

6.2.4 Whole person learning

Prinsloo *et al* (2006) also echoed the fact that education should not only include acquiring of working knowledge of legislation but interrogate paradoxes that managers face. They have proposed a whole person learning approach. In such an approach management development focuses more on stakeholders rather than shareholders.

Recall that Zola Mining showed an above norm Maintain Norms (stage 4) DIT score. The problem with such organisational moral development level is the fact that people only do what their peers are doing rather than what is right (Logsdon and Yuthas, 1997). In the words of Halbesleben *et al* 2005 that would be called pluralistic ignorance. When the whole person has been developed, people will do what is right regardless of the norm. In such an organisation higher post conventional scores could be seen.

6.2.5 Antidote for Pluralistic Ignorance (PI)

Researchers like Halbesleben, Wheeler and Buckley (2005) said despite enormous literature on ethics education, few studies have found support for effectiveness in changing an individual's ethical standards through programmatic training. In order to close this gap Halbesleben *et al* (2005) have proposed to reduce pluralistic ignorance (a social cognitive error). They have seen an improved effectiveness when a social or cultural context was embedded into the training program.

Social cognitive researchers have commonly found that ambiguous situations facilitates social comparisons (if in doubt look at your neighbour) which could result in error (Halbesleben *et al* 2005). Cultures formed by wrong perceptions of what is acceptable or not result in suboptimal decision making.

Pluralistic ignorance lowering ethics education program helps managers to form prototypes of good and bad behaviour (Halbesleben *et al* 2005). They concluded by saying individuals make decisions based upon the overlap of their own self concept and their prototype person in a particular dilemma.

6.2.6 The role of emotions in training

Critics of business ethics training have asserted that it is difficult if not impossible to determine whether individuals have become more ethical or not (Litzky and Oz, 2008). They believed that including teaching methods that uses affective domain principles can help to improve decision-making (Litzky and Oz, 2008). Bloom cited in Litzky and Oz (2008) said the affective domain is a

continuum of internalising of values, beliefs and practices. Therefore by such internalisation process we could expect long term ethical reasoning changes.

Pelletier and Bligh (2008) said ethics intervention after scandals should be aimed at healing and re-establishing social legitimacy. Employees' reactions to scandals include cynicism, pessimism and paranoia. They suggest that healing should happen at both the organizational level and individual level.

Zola Mining should consider doing an 'emotional audit'. Putting a bandage over a septic wound does not help. A study done by Pelletier and Bligh (2008) revealed a lot of employee emotions. Some felt that ethics training was crammed down the throats. Some felt creation of ethics office was a waste of money. Some said nothing will change, while others were optimistic about the future.

6.2.7 Hypothesis 1 summary

Relevant literature has been summarized in Table 2.4 above to show in which direction the scale is tipping if ethics training (tone, mode, method, content, etc) does not change. The researcher therefore concludes that ethics training has not added noticeable value in Zola Mining.

One may argue that the organization is nearing the moral development threshold, thus there is no amount of training that could improve the situation. To answer such an argument, the researcher has looked at the second hypothesis.

6.3 Hypothesis 2 discussion

Data showed that the null hypothesis can not be rejected. The average p-score for the trained managers was 28.38 while the median was 22. The mean could not be effectively analysed because the sample size was small. A median was more suitable for further analysis. Therefore the trained Zola leaders had an average p-score of less than 35.

There was no significant literature that supports the magic number of 35 rather than a benchmarking exercise using previous group studies. As shown in chapter three, effective training by definition had to move participants' moral judgement to significant levels in absolute terms, not just relative movement compared to the control group.

6.3.1 Results comparison previous studies

Zola's top management set an expectation of 35 for the experiment group. The score of 35 was below an average p-score of someone with a senior qualification (Bebeau and Thoma, 2003). The second benchmark compared p-score values from a study performed by Vitton and Wasonga (2009). Zola Mining average score was just below average high school students on those studies, see Table 3.2.

The last benchmark was based on a study done by Ho and Lin (2008) in order to obtain a p-score proxy from a non-US sample. Zola Mining p-score was lower than that of Taiwanese accounting students. The sample was so small for any sensible conclusions.

6.3.2 Possible reasons for lower score

As already mentioned, the small (n=5) sample size cast doubt on the findings of this hypothesis. Secondly, the low level of p-score could be attributed to the lack of females on the samples. To illustrate the point, Table 6.1 below shows that females achieve higher post conventional scores than males for different educational levels and age brackets (Bebeau and Thoma, 2003).

Table 6.1: Males vs Females per level of educational level

Male P-score	Female P-score	Educational level
32.19	35.26	Grade 10-12
29.6	33.88	Vocational / tech
28.87	32.27	Jr. College
15.68	36.61	Junior
28.38 (actual)	**N/A**	**Zola Mining (experiment group)**
34.58	40.03	Senior
38.19	43.08	MS Degree
42.29	47.66	Professional degree
34.35	**38.61**	Overall based on sample of over 10 000

Source: Bebeau and Thoma (2003)

6.3.3 Hypothesis 2 summary

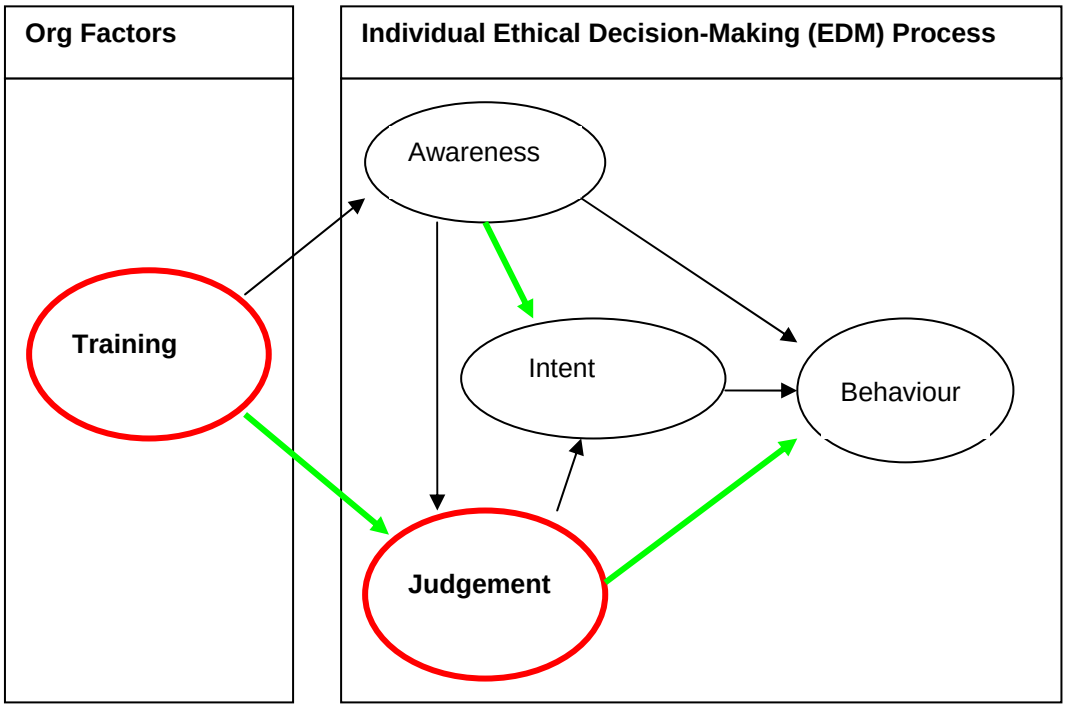
It proved that the p-score of 35 was not out of reach as was set by company's management. As was with hypothesis one, the status quo (null hypothesis) could not be rejected with a 95% confidence level.

6.4 Chapter summary

A research model was proposed in chapter two. The researcher is now in a position to see if all objectives were met. Figure 2.4 could be modified to look

like Figure 6.1 since the link between ethics training and change in moral judgement could not be established with a 95% confidence. Overall the findings are in line with the literature reviewed in chapter two. The next chapter will offer recommendations to Zola Mining and practitioners.

Figure 6.1: This research's Final Model



Legend: **Adapted from: Mustamil and Quaddus 2009**
Red = this research
Black = link proven elsewhere
Green = still to be proven

7. Conclusion

7.1 Findings highlights

Research results have failed to disprove the status quo, there was no moral reasoning difference between trained managers and untrained ones. Ethics training could not be said that it moves participants from stage 4 to post conventional thinking. The second finding was the offered training did not improve moral reasoning to benchmark levels. Below the researcher offers some recommendations arranged per typical ethics education critic.

7.2 Provide appropriate amount of training

Organizations that seek to improve their ethical climate should start with emotional audit aimed at access how people feel. Depending on the seriousness of specific findings, companies could overdo a good thing and receive the opposite results (O' Fallon and Butterfield (2005).

The second recommendation would be to only expose willing people to ethics training. Top management's responsibility would be to win the majority of the people to the vision rather than making it mandatory in specific positions. Once the burning platform has been created and buy-in achieved too much training should not be a concern.

7.3 Transform tertiary education

Ethics training has been seen as coming head-on with traditional business education (Gray and Clark, 2002; Sauser, 2004; Ritter, 2006). People joke about business ethics being an oxymoron. Curry and Thach (2007) have surveyed attitudes of business school deans towards providing ethics education. At that stage there was still a lot of different views about the structure and content of such training. Given the momentum of current global crisis, tertiary education landscape should also transform.

The researcher recommends that ethics training be part of every business school curriculum. Various under graduate faculties are contemplating making ethics education part and parcel of mainstream education (Sinha et al (2007). Some professional organisations have also started ethics training as part of continual education for their constituencies (Sauser, 2004; Elder, 2004; Lozano, Paula-Salvador, Gozalvez and Boni, 2006).

Based on the work of Prinsloo, Beukes and de Jongh (2006), the researcher recommends that all institutions strive to develop the whole person rather than providing particular skills only. Ethics training should be engrain values. At the end of it all education should provide guidance for long term sustainability for all stakeholders.

7.4 Consider Critical Action Learning

A build on the much needed tertiary education transformation recommended above is the concept of Critical Action Learning. Based on the Hartog's (2004) work, Zola Mining should look at Critical Action Learning. In order to improve training intervention success rate, organizations like Zola should firstly consider making reflective practice in promoting individual ethical practice. A formalized reflective process could provide a 'balcony' were managers could retreat to see the big picture with being caught it the moment of daily duties. Such a practice will enhance awareness and facilitate ethical practice for managers in their professional lives.

The second level is the organizational level. Critical Action Learning should be considered to form part of management development. It has potential to influence society as a whole.

South African institutions could explore using Critical Action Learning in the traditional programs like MBA and various ethics courses. Hartog and associates have successfully used it in their Masters in Personal and Organizational Development (Hartog, 2004). Cole and Smith cited in Halbesleben *et al* 2005 attributed the lack of ethics course effectiveness to the overwhelming business education emphasis on profits and productivity.

7.5 Reduce Pluralistic Ignorance

Pluralistic Ignorance (PI) lowering program has been empirically proven to work in a business school context but not in business environment (Halbesleben *et al* 2005). However Zola Mining could consider introducing it as part of their in-house training or general campaigns. For external training, they could attend ethics training as management group rather than individuals from different business randomly.

7.6 The role of emotions in training

Pelletier and Bligh (2008) pointed out that intervention timing is critical. Interventions after scandals could be seen as window dressing if not managed properly. They said ethics intervention after scandals should be aimed at healing and re-establishing social legitimacy. Employees' reactions to scandals include cynicism, pessimism and paranoia. They suggest that healing should happen at both the organizational level and individual level.

7.7 Future research

Various constraints have not allowed the researcher to look at some key issues around the effectiveness of ethics training. Research limitations were discussed in chapter five above.

7.7.1 Stratify according to date of attendance

At the time of this research only 50 managers have attended the ethics course, which limited any kind of sample stratification. When the population size becomes significant, one could stratify the sample by date of attendance. The main purpose for such a study would be to investigate if ethics training does wear off with time or not. Is there a case for re-training?

7.7.2 Include females on the sample

In male dominant environments like mining, it was challenging to obtain female input into the study. Future research on the ethics should make an extra effort in sampling females as was observed that they improve post convectional thinking (Bebeau and Thoma, 2003). Also see Table 6.1.

7.7.3 Research another South African company

It was demonstrated in earlier chapter that organizational context plans an important role in employee behavior. In order to eliminate organisation specific barriers, a separate company that receives the same course should be investigated. The purpose of such a study will indicate the Zola Mining and others to focus on internal matters or change the course.

7.7.4 Investigate offices outside South Africa

Previous studies (Rottig and Heischmidt, 2007; Beekun, Hamdy, Westerman and HassabEnalby, 2008; Ho and Lin, 2008; Hamilton, Knouse and Hill, 2009; Mustamil and Quaddus, 2009) have indicated that national culture could not be

ignored when studying ethics. On future research Zola Mining overseas managers should be sampled in order to see any national cultural differences within the same company.

7.8 Conclusion

Tough sample was small due to various constraints, the research objectives were met. Various recommendations have been made. Few future research ideas have been tabled. On the personal level the research project has been an amazing journey, with lots of growth opportunities.

8. References:

Altier, W.J. (1999) *The Thinking manager's toolbox: effective processes for problem solving and decision making*. Oxford University Press.

Annas, J. (1995) Prudence and Morality in ancient and modern ethics. *Ethics*, 105(2) 241-417.

Aupperle, K.E. (2008) Moral Decision Making: Searching for the highest expected moral value. *International Journal of Organisational Theory and Behaviour*, Spring (11) 1-11.

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. P*ersonality and Social Psychology Review*. [Special Issue on Evil and Violence], *3*, 193-209.

Bebeau, M.J. & Thoma, S.J. (2003) *Guide for DIT-2*. Centre for study of ethical development.

Beekun, R.I., Hamdy, R., Westerman, J.W. & HassabElnaby, H.R. (2008) An Exploration of Ethical Decision-making Processes in the United States and Egypt. *Journal of Business Ethics,* 82, 587–605

Cottone, R.R. & Claus, R.E. (2000) Ethical Decision-Making Models: A Review of the literature. *Journal of Counselling & Development*, 78(Summer), 275-283

Covrig, D.M. (2000) The organisational Context of moral dilemmas: The role of moral leadership is administration in making and breaking dilemmas. *Journal of Leadership Studies*. 7.1. 40-54

Curry, T.J. & Thach, S.V. (2007) Business ethics: Attitudes of business deans around the world. *Journal of Development Area*. Fall 41(1), 237-245

De Casterle', B.D., Izumi, S., Godfrey, N.S., & Denhaerynck, K. (2008) Nurses' responses to ethical dilemmas in nursing practice: meta-analysis. Journal of Advanced Nursing 63(6), 540-549.

de Colle, S, & Werhane, P.H, (2008) Moral Motivation Across Ethical Theories: What Can We Learn for Designing Corporate Ethics Programs. *Journal of Business Ethics* 81, 751–764

Elder, K.E. (2004) Ethics Education in the Consulting Engineering Environment: Where Do We Start. *Science and Engineering Ethics*, 10(2), 325-36.

Ernst and Young (2009) www.ey.com/Publication/vwLUAssets/2009_business_risk_report/$FILE/2009_business_risk_report.pdf accessed in 1 September 2009.

Farrell, H. & Farrell, B.J. (1998) The Language of Business Codes of Ethics: Implications of Knowledge and Power. *Journal of Business Ethics*, 17: 587 – 601.

Gray, K.R, & Clark, G.W. (2002) Addressing corporate scandals through business education. *International Journal on world peace*, 15, 43-62.

Halbesleben, J.R.B., Wheeler, A.R. & Buckley, M.R. (2005) Everybody Else is Doing it, So Why Can't We? Pluralistic Ignorance and Business Ethics Education. *Journal of Business Ethics,* 56: 385–398.

Hamilton, J.B., Knouse, S.B., & Hill, V. (2009) Google in China: A manager-friendly heursistic model for resolving cross-cultural ethical conflicts. *Journal of Business Ethics*, 86: 143 – 157.

Harrington, S.J. (1991) What corporate America is teaching about ethics. *Academy of management executive*, 5(1), 21-30

Hartog, M. (2004) Critical Action Learning. *Reflective Practice*, 5(3), 395-407.

Heller, F.A., Drenth, P.J.D., Koopman, P.L. & Rus, V. (1983) A contingency model of participative decision making: an analysis of 56 decisions in three Dutch organisations. *The British Psychology Society*, 56, 1-18.

Ho, Y. & Lin, C. (2008) Cultural values and cognitive moral development of accounting ethics: a cross-cultural study. *Social Behaviour and Personality*, 36(7), 883-892.

Kay, S.R. (1982) Kohlberg's theory of moral development: critical analysis of validation studies with the defining issues test. *International Journal of Psychology*, 17, 27-42

Kreie, J. & Cronan, T.P. (2000) Making ethical decisions. *Communications of the ACM*, Vol. 43 Issue 12, p66-71.

Litzky, B.E. & Oz, E. (2008) Ethics issues in information technology: does education make a difference? *International Journal of Information and Communication Technology Education* ,4(2) April-June p.67-84.

Logsdon, J.M. & Yuthas, K. (1997) Corporate social performance, stakeholder orientation, and organisational moral development. *Journal of Business Ethics* 16:1213-1226.

Loviscky, G.E., Trevino, L.K & Jacobs, R.R. (2007) Assessing Managers' Ethical Decision-making: An Objective Measure of Managerial Moral Judgment. *Journal of Business Ethics* 73:263–285

Lozano, J.F, Palau-Salvador, G, Govalvez, V & Boni, A. (2006) The Use of Moral Dilemmas for teaching agriculture engineers. Science and Engineering Ethics. 12(2). 327-334

Mail & Guardian (2007) Tiger Brands Slapped with a R98 million cartel fine. Available from http://www.mg.co.za/article/2007-11-12-tiger-brands-slapped-with-r98m-cartel-fine (accessed 1 May 2009)

Moore, C. (2008) Moral disengagement in the process of organisational corruption. *Journal of Business Ethics*, June 80(1), 129-140

Mumford, M., Connelly, S., Brown, R.P., Murphy, S.T., Hill, J.H. Antes, A., Waples, E.P., & Devenport, L.D. (2008) A Sensemaking Approach to Ethics Training for Scientists: Preliminary Evidence of Training Effectiveness*. Ethics and Behavior Journal*, 18 (4), 315-339.

Mustamil, N. & Quaddus, M. (2009) Cultural influence in the ethical decision making process: the perspective of Malaysian managers. *The Business Review*, Cambridge. 13(1), 171- 176

O' Fallon, M.J. & Butterfield, K.D. (2005) A Review of The Empirical Ethical Decision-Making Literature: 1996-2003. *Journal of Business Ethics,* 59, 375-413

O' Grady, M. (2002) *An analysis of the social responsible / ethical strategies of a pharmaceutical organisation throughout the life cycle of a controversial drug*. MBA thesis, GIBS.

Pelletier, K.L. & Bligh, M.C. (2008) The aftermath of organisational corruption: employee attributions and emotional reactions. *Journal of Business Ethics* 80(4), 823-845.

Premeaux, S. (2009) The link between management behaviour and ethical philosophy in the wake of the Enron convictions. *Journal of Business Ethics* 85, 13-25.

Prinsloo, P., Beukes, C. & de Jongh, D. (2006) Corporate citizenship education for responsible business leaders. *Development Southern Africa*. 23(2). 197-211.

Robinett, T. L. (2008) A Comparison of Moral Reasoning Stages Using a Model of Hierarchical Complexity. *World Futures*, 64(5), 468 – 479.

Rottig, D. & Heischmidt, K.A. (2007) The Importance of ethical training for the improvement of ethical decision-making: Evidence from Germany and the United States. *Journal of Teaching in international business*, 18(4), 5-35.

Salvador, R. & Folger, R.G. (2009) Business ethics and the brain. *Business Ethics Quarterly,* 19(1) January, 1-32.

Sauser, W.I. (2004) Teaching Business Ethics to Professional Engineers. Science and Engineering. 10(2). 337-347

Sinha, K.S., Thomas, H.R. & Kulka, J.R. (2007) Integrating ethics into the engineered construction curriculum. *Journal of professional issues in engineering*

Stevens, B. (2008) Corporate ethical codes: effective instruments for influencing behaviour. *Journal of Business Ethics*. 78, 601-609.

The Star (2008) Sasol faces a R3.7 billion price-fixing penalty. Available from http://www.iol.co.za/index.php?click_id=13&set_id=1&art_id=vn20081002060234980C822254 (accessed 1 May 2009)

Transparency International http://www.transparency.org/news_room/in_focus/2008/cpi2008/cpi_2008_table (accessed 6 November 2009)

Vitell, S.J. & Singhapakdi, A. (2008) The Role of ethics institutionalization in influencing organisational commitment, job satisfaction and esprit de corps. *Journal of business ethics*, 81, 343- 353.

Vitton, C.J. & Wasonga, T. A. (2009) Between Kohlberg and Gilligan: Levels of Moral Judgment among Elementary School Principals. *Leadership and Policy in Schools*, 8(1), 92 -116.

West, J.P. & Berman, E.M. (2004) Ethics Training in US Cities. *Public Integrity*. 6(3),189-206

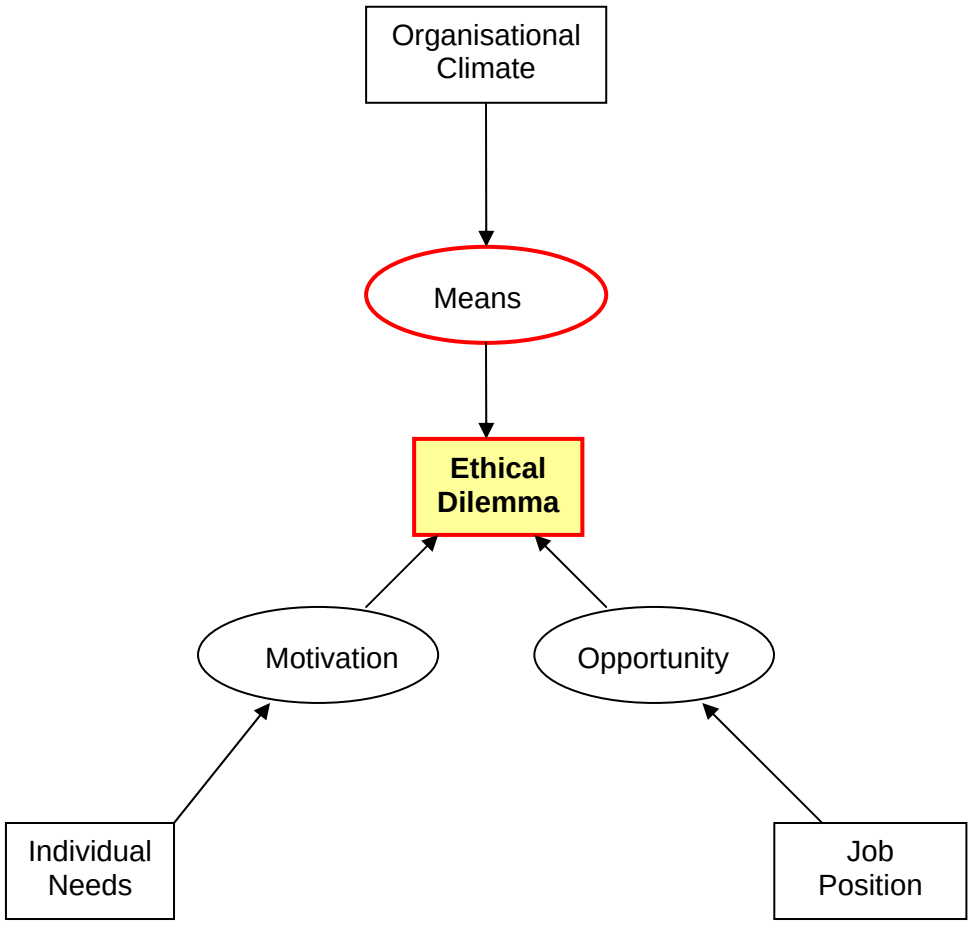
White, D.W. & Lean, E. (2008) The impact of perceived leader. *Journal of Business Ethics*. Sep. 81(4), 765-779.

Yin, R.K. (2002) *Case study research: design and methods*. Sage publication, Inc, California

Yin, X. & Douglas, Z. (2008) Reward system, Moral reasoning and Internal auditors' reporting wrongdoing, *Journal of Business & Psychology*, Jun, 22(4), 323-331.

Zikmund, W.G. (2003) Business Research Methods 7th edition. South-Western Oklahoma

Appendix 1: Components of ethical dilemmas



Source: O'Grady (2002) adapted from White & Lam model

Appendix 2: Summary of practice based models

Summary of Steps or Stages of Practice-Based Ethical Decision-Making Models

Corey, Corey, & Callanan (1998)	Forester-Miller & Davis (1996)	Keith-Spiegel & Koocher (1985)	Rae, Fournier, & Roberts (in press)	Stadler (1986)	Steinman, Richardson, & McEnroe (1998)	Tarvydas (1998)	Tymchuk (1986)	Welfel (1998)
1. Identify the problem	1. Identify the problem	1. Describe the parameters		1. Identify competing principles	1. Identify the problem	1. Interpret situation	1. Determine stakeholders	1. Develop ethical sensitivity
2. Identify potential issues involved		2. Define the potential issues	1. Gather information	2. Secure additional information		2. Review problem or dilemma		2. Define the dilemma and options
3. Review relevant ethical guidelines	2. Apply the ACA *Code of Ethics*	3. Consult legal and ethical guidelines	2. Consult legal and ethical guidelines	3. Consult with colleagues	2. Identify the relevant ethical standard	3. Determine standards that apply to dilemma		3. Refer to professional standards
4. Obtain consultation	3. Determine nature of dilemma	4. Evaluate the rights, responsibilities, and welfare of all		4. Identify hoped-for outcomes	3.Determine possible ethical traps			4. Search out ethics scholarship
5. Consider possible and probable courses of action	4. Generate potential courses of action	5 Generate alternate decisions	3. Generate possible decisions	5. Brainstorm actions to achieve outcomes	4. Frame preliminary response	4. Generate possible and probable courses of action	2. Consider all possible alternatives	5. Apply ethical principles to situation
6. Enumerate consequences of various decisions	5. Consider potential consequences, determine course of action	6. Enumerate the consequences of each decision	4. Examine possible outcomes, given context	6. Evaluate effects of actions	5. Consider consequences of that response	5. Consider consequences for each course of action	3. Consider consequences for each alternative	
		7. Estimate probability for outcomes of each decision		7. Identify competing nonmoral values		6. Consult with supervisor and peers		6. Consult with supervisor and peers
7. Decide on best course of action		8. Make the decision		8. Choose a course of action	6. Prepare an ethical resolution	7. Select an action by weighing competing values, given context	4. Balance risks and benefits to make the decision	7. Deliberate and decide
	6. Evaluate selected course of action			9. Test the course of action	7. Get feedback from peers and supervisor		5. Decide on level of review	
	7. Implement course of action		5. Implement best choice and evaluate	10. Identify steps, take action, evaluate	8. Take action	8. Plan and execute the selected action	6. Implement the decision	8. Inform supervisor and take action
			6. Modify practices to avoid future problems			9. Evaluate course of action	7. Monitor the action and outcome	9. Reflect on the experience

Note. ACA = American Counseling Association.

Source: Cottone and Claus (2000)

Appendix 3: Ethics concepts summary

Yin's Level	Cognitive	Affective
Individual	Neuroethics -Salvador & Folger (2009) Cognitive dissonance theory – Festinger (1957), Logsdon & Yuthas (1997) Moral reasoning / Moral development Level1: Managerial prerogative theory Moral disengagement (Albert Bandura, 1990 Contingent model - Heller at al, (1983)	
Group	Whole-person education (Prinsloo et al, 2006) Group decision making theory	
Organisational	Organisational culture and ethics Level 2: Stockholder theory Values Rewards Training	
Societal	Cognitive error –Halbesleben et al (2005) Social learning theory – Paul Datti Cultural influences – Hosftede, 1980) National culture and ethics (Beekun et al, 2008) Level 3: Stakeholder theory, Social harmony	

	Teleological (consequentialism) – it depends on the outcome	**Deontological (rightness or wrongness) – inherently good or evil**
Individual	Internalism ethics (TH Green)	Relativism vs idealism
Group	Externalism ethics (John Skorupski)	
Organisational	Deontology influenced sales managers' ethical judgement more than teleological (O'Fallon & Butterfield, 2005)	
Societal	Liberal communitarian (political theory)	

	Utilitarian (greatest good for the greatest number)	**Eudaemonist (happiness – Greek)**
Individual	Hedonism – pleasure Ethical Egoism – individual Ethical Altruism – live for others Evolutionary ethics – survival & growth Despotism – power Pragmatism – satisfaction & adjustment Existentialism – freedom Preference utility- Peter Singer Individual rights – Kohlberg Expected utility theory – subjective probability Choices under uncertainty	Virtue ethics – character of the agent Excellence Ultimate end – Agent acts in a faithful manner (Max Weber, 1918) Poliheuristic (PH) (since 1993) - Means many shortcuts (usually foreign policy)
Group	Behavioural economics	
Organisational		
Societal	Social contract Level 3: Utilitarian theory, Rawlsian theory Theories developed for speciality practices Practice-based models	

	Normative ethics **Moral philosophy & Theology realms** **(How should people behave)**	**Descriptive or empirical ethics** **Management & Business realms** **(Explaining and predicting actual behaviour)**
Individual	Rawls, 1971	O'Fallon & Butterfield, 2005
Group		
Organisational		
Societal		

Appendix 4: DIT-2 ethical dilemmas

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

DIT-2

Defining Issues Test

Version 3.1

University of Minnesota

University of Alabama

Center for the Study of Ethical Development

Instructions

This questionnaire is concerned with how you define the issues in a social problem. Several stories about social problems will be described. After each story, there will be a list of questions. The questions that follow each story represent different issues that might be raised by the problem. In other words, the questions / issues raise different ways of judging what is important in making a decision about the social problem. You will be asked to rate and rank the questions in terms of how important each one seems to you.

This questionnaire is in two parts: one part contains the **INSTRUCTIONS** (this part) and the stories presenting the social problems; the other part contains the questions (issues) and the **ANSWER SHEET** on which to write your responses.

Here is an example of the task:

Presidential Election

Imagine that you are about to vote for a candidate for the Presidency of the United States. Imagine that before you vote, you are given several questions, and asked which issue is the most important to you in making up your mind about which candidate to vote for. In this example, 5 items are given. On a rating scale of 1 to 5 (1=Great, 2=Much, 3=Some, 4=Little, 5=No) please rate the importance of the item (issue) by filling in with a pencil one of the bubbles on the answer sheet by each item.

Assume that you thought that item #1 (below) was of great importance, item #2 had some importance, item #3 had no importance, item #4 had much importance, and item #5 had much importance. Then you would fill in the bubbles on the answer sheet as shown below.

GREAT	MUCH	SOME	LITTLE	NO	**Rate the following 12 issues in terms of importance (1-5)**
●	②	③	④	⑤	1. Financially are you personally better off now than you were four years ago?
①	②	●	④	⑤	2. Does one candidate have a superior moral character?
①	②	③	④	●	3. Which candidate stands the tallest?
①	●	③	④	⑤	4. Which candidate would make the best world leader?
①	●	③	④	⑤	5. Which candidate has the best ideas for our country's internal problems, like crime and health care?

Further, the questionnaire will ask you to rank the questions in terms of importance. In the space below, the numbers 1 through 12, represent the item number. From top to bottom, you are asked to fill in the bubble that represents the item in first importance (of those given you to choose from), then second most important, third most important, and fourth most important. Please indicate your top four choices. You might fill out this part, as follows:

Rank which issue is the most important (item number).

Most important item	●②③④⑤⑥⑦⑧⑨⑩⑪⑫	Third most important	①②③●⑤⑥⑦⑧⑨⑩⑪⑫
Second most important	①②③④●⑥⑦⑧⑨⑩⑪⑫	Fourth most important	①●③④⑤⑥⑦⑧⑨⑩⑪⑫

Note that some of the items may seem irrelevant to you (as in item #3*)* or not make sense to you—in that case, **rate** the item as "No" importance and do not **rank** the item. Note that in the stories that follow, there will be 12 items for each story, not five. Please make sure to consider all 12 items (questions) that are printed after each story.

In addition you will be asked to state your preference for what action to take in the story. After the story, you will be asked to indicate the action you favor on a three-point scale (1 = strongly favor some action, 2 = can't decide, 3 = strongly oppose that action).

In short, read the story from this booklet, and then fill out your answers on the answer sheet. Please use a #2 pencil. If you change your mind about a response, erase the pencil mark cleanly and enter your new response.

[Notice the second part of this questionnaire, the Answer Sheet. The Identification Number at the top of the answer sheet may already be filled in when you receive your materials. If not, you will receive instructions about how to fill in the number. If you have questions about the procedure, please ask now.

Please turn now to the Answer Sheet.]

Famine— (Story #1)

The small village in northern India has experienced shortages of food before, but this year's famine is worse than ever. Some families are even trying to feed themselves by making soup from tree bark. Mustaq Singh's family is near starvation. He has heard that a rich man in his village has supplies of food stored away and is hoarding food while its price goes higher so that he can sell the food later at a huge profit. Mustaq is desperate and thinks about stealing some food from the rich man's warehouse. The small amount of food that he needs for his family probably wouldn't even be missed.

[If at any time you would like to reread a story or the instructions, feel free to do so. Now turn to the Answer Sheet, go to the 12 issues and rate and rank them in terms of how important each issue seems to you.]

Reporter— (Story #2)

Molly Dayton has been a news reporter for the *Gazette* newspaper for over a decade. Almost by accident, she learned that one of the candidates for Lieutenant Governor for her state, Grover Thompson, had been arrested for shop-lifting 20 years earlier. Reporter Dayton found out that early in his life, Candidate Thompson had undergone a confused period and done things he later regretted, actions which would be very out-of-character now. His shop-lifting had been a minor offense and charges had been dropped by the department store. Thompson has not only straightened himself out since then, but built a distinguished record in helping many people and in leading constructive community projects. Now, Reporter Dayton regards Thompson as the best candidate in the field and likely to go on to important leadership positions in the state. Reporter Dayton wonders whether or not she should write the story about Thompson's earlier troubles because in the upcoming close and heated election, she fears that such a news story could wreck Thompson's chance to win.

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

School Board— (Story #3)

Mr. Grant has been elected to the School Board District 190 and was chosen to be Chairman. The district is bitterly divided over the closing of one of the high schools. One of the high schools has to be closed for financial reasons, but there is no agreement over which school to close. During his election to the school board, Mr. Grant had proposed a series of "Open Meetings" in which members of the community could voice their opinions. He hoped that dialogue would make the community realize the necessity of closing one high school. Also he hoped that through open discussion, the difficulty of the decision would be appreciated, and that the community would ultimately support the school board decision. The first Open Meeting was a disaster. Passionate speeches dominated the microphones and threatened violence. The meeting barely closed without fist-fights. Later in the week, school board members received threatening phone calls. Mr. Grant wonders if he ought to call off the next Open Meeting.

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

Cancer— (Story #4)

Mrs. Bennett is 62 years old, and in the last phases of colon cancer. She is in terrible pain and asks the doctor to give her more pain-killer medicine. The doctor has given her the maximum safe dose already and is reluctant to increase the dosage because it would probably hasten her death. In a clear and rational mental state, Mrs. Bennett says that she realizes this; but she wants to end her suffering even if it means ending her life. Should the doctor give her an increased dosage?

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

Demonstration — (Story #5)

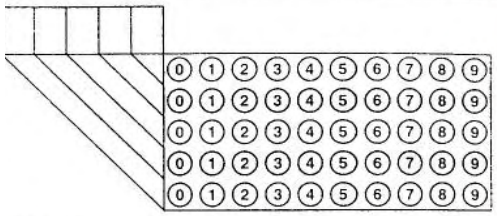
Political and economic instability in a South American country prompted the President of the United States to send troops to "police" the area. Students at many campuses in the U.S.A. have protested that the United States is using its military might for economic advantage. There is widespread suspicion that big oil multinational companies are pressuring the President to safeguard a cheap oil supply even if it means loss of life. Students at one campus took to the streets, in demonstrations, tying up traffic and stopping regular business in the town. The president of the university demanded that the students stop their illegal demonstrations. Students then took over the college's administration building, completely paralyzing the college. Are the students right to demonstrate in these ways?

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

DIT-2 Answer Sh

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

University of Minnesota



Please read story #1 in the INSTRUCTIONS booklet.

Famine -- (Story #1)

What should Mustaq Singh do? Do you favor the action of taking the food? (Mark one.)

① Should take the food ② Can't decide ③ Should not take the food

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

1. Is Mustaq Singh courageous enough to risk getting caught for stealing?
2. Isn't it only natural for a loving father to care so much for his family that he would steal?
3. Shouldn't the community's laws be upheld?
4. Does Mustaq Singh know a good recipe for preparing soup from tree bark?
5. Does the rich man have any legal right to store food when other people are starving?
6. Is the motive of Mustaq Singh to steal for himself or to steal for his family?
7. What values are going to be the basis for social cooperation?
8. Is the epitome of eating reconcilable with the culpability of stealing?
9. Does the rich man deserve to be robbed for being so greedy?
10. Isn't private property an institution to enable the rich to exploit the poor?
11. Would stealing bring about more total good for everybody concerned or wouldn't it?
12. Are laws getting in the way of the most basic claim of any member of a society?

Rank which issue is the most important (item number).

Most important item ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ Third most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Second most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ Fourth most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Now please return to the Instructions booklet for the next story.

Reporter -- (Story #2)

Do you favor the action of reporting the story? (Mark one.)

① Should report the story ② Can't decide ③ Should not report the story

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

1. Doesn't the public have a right to know all the facts about all the candidates for office?
2. Would publishing the story help Reporter Dayton's reputation for investigative reporting?
3. If Dayton doesn't publish the story wouldn't another reporter get the story anyway and get the credit for investigative reporting?
4. Since voting is such a joke anyway, does it make any difference what reporter Dayton does?
5. Hasn't Thompson shown in the past 20 years that he is a better person than his earlier days as a shop-lifter?
6. What would best serve society?
7. If the story is true, how can it be wrong to report it?
8. How could reporter Dayton be so cruel and heartless as to report the damaging story about candidate Thompson?
9. Does the right of "habeas corpus" apply in this case?
10. Would the election process be more fair with or without reporting the story?
11. Should reporter Dayton treat all candidates for office in the same way by reporting everything she learns about them, good and bad?
12. Isn't it a reporter's duty to report all the news regardless of the circumstances?

Rank which issue is the most important (item number).

Most important item ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ Third most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Second most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ Fourth most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Now please return to the Instructions booklet for the next story.

PLEASE DO NOT WRITE IN THIS AREA

993189

SCANTRON Mark Reflex® MM73897-4:28

Appendix 5: University of Alabama Report – Raw data only

Other variables were not include in report to ensure confidentiality

Group	stage 2/3 score	stage 4 score	p-score	N2 score	Type indicator	Gender
Untrained	22	20	48	26.53	6	male
Untrained	6	42	42	26.8	7	male
Untrained	18	40	42	31.58	7	male
Untrained	8	54	38	47.24	4	male
Untrained	8	48	40	41.35	4	male
Untrained	28	50	18	31.47	4	male
Untrained	16	52	22	26.2	4	male
Untrained	14	58	18	15.06	4	male
Untrained	20	36	34	20.64	5	male
Untrained	20	34	18	25.59	4	male
Untrained	6	50	32	14.06	5	male
Untrained	32	24	44	42.61	6	male
Untrained	10	48	24	22.95	5	male
Trained	10	68	22	35.16	4	male
Trained	10	62	22	30.23	4	male
Trained	30	26	42	42.47	6	male
Trained	24	32	40	48.66	7	male
Trained	18.18	65.91	15.91	23.42	3	male

Appendix 6: Hypothesis 1 statistics report

Two-Sample Test Report

Page/Date/Time 1 10/30/2009 3:21:25 PM
Database \\sasdfls03\profilesb$\zwane ... CSS 2007\Report\Data only.S0

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Standard Error	95.0% LCL of Mean	95.0% UCL of Mean
Untrained	13	32.30769	11.01048	3.053759	25.65412	38.96126
Trained	5	28.382	11.80507	5.279387	13.72407	43.03993

Note: T-alpha (Untrained) = 2.1788, T-alpha (Trained) = 2.7764

Confidence-Limits of Difference Section

Variance Assumption	DF	Mean Difference	Standard Deviation	Standard Error	95.0% LCL Difference	95.0% UCL Difference
Equal	16	3.925692	11.21441	5.901412	-8.584743	16.43613
Unequal	6.87	3.925692	16.14281	6.098965	-10.55238	18.40377

Note: T-alpha (Equal) = 2.1199, T-alpha (Unequal) = 2.3739

Equal-Variance T-Test Section

Alternative Hypothesis	T-Value	Prob Level	Reject H0 at .050	Power (Alpha=.050)	Power (Alpha=.010)
Difference <> 0	0.6652	0.515390	No	0.095979	0.024831
Difference < 0	0.6652	0.742305	No	0.011220	0.001645
Difference > 0	0.6652	0.257695	No	0.156852	0.043166

Difference: (Untrained)-(Trained)
The randomization test results are based on 1000 Monte Carlo samples.

Aspin-Welch Unequal-Variance Test Section

Alternative Hypothesis	T-Value	Prob Level	Reject H0 at .050	Power (Alpha=.050)	Power (Alpha=.010)
Difference <> 0	0.6437	0.540681	No	0.086436	0.020361
Difference < 0	0.6437	0.729660	No	0.012873	0.002097
Difference > 0	0.6437	0.270340	No	0.143959	0.036206

Difference: (Untrained)-(Trained)
The randomization test results are based on 1000 Monte Carlo samples.

Tests of Assumptions Section

Assumption	Value	Probability	Decision(.050)
Skewness Normality (Untrained)	-0.3179	0.750569	Cannot reject normality
Kurtosis Normality (Untrained)	-2.0507	0.040295	Reject normality
Omnibus Normality (Untrained)	4.3065	0.116109	Cannot reject normality
Skewness Normality (Trained)	0.0000		
Kurtosis Normality (Trained)		1.000000	Cannot reject normality
Omnibus Normality (Trained)			
Variance-Ratio Equal-Variance Test	1.1495	0.760315	Cannot reject equal variances
Modified-Levene Equal-Variance Test	0.0258	0.874435	Cannot reject equal variances

Two-Sample Test Report

Page/Date/Time 2 10/30/2009 3:21:25 PM
Database \\sasdfls03\profilesb$\zwane ... CSS 2007\Report\Data only.S0

Median Statistics

Variable	Count	Median	95.0% LCL of Median	95.0% UCL of Median
Untrained	13	34	18	42
Trained	5	22		

Mann-Whitney U or Wilcoxon Rank-Sum Test for Difference in Medians

Variable	Mann Whitney U	W Sum Ranks	Mean of W	Std Dev of W
Untrained	39.5	130.5	123.5	10.0765
Trained	25.5	40.5	47.5	10.0765

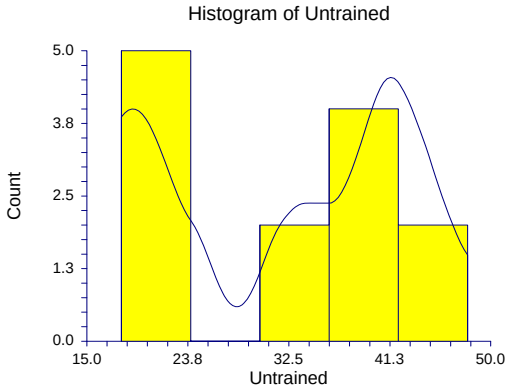
Number Sets of Ties = 4, Multiplicity Factor = 78

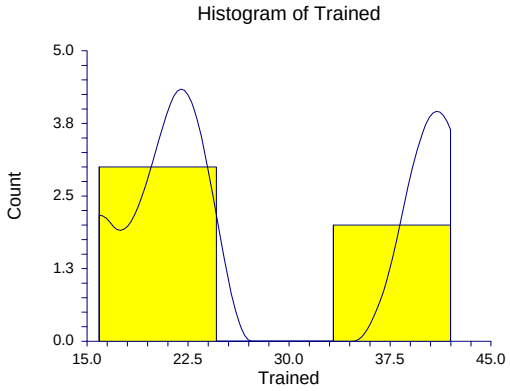
Alternative Hypothesis	Exact Probability Prob Level	Exact Probability Reject H0 at .050	Approximation Without Correction Z-Value	Approximation Without Correction Prob Level	Approximation Without Correction Reject H0 at .050	Approximation With Correction Z-Value	Approximation With Correction Prob Level	Approximation With Correction Reject H0 at .050
Diff<>0			-0.6947	0.487253	No	-0.6451	0.518885	No
Diff<0			-0.6947	0.756374	No	-0.7443	0.771654	No
Diff>0			-0.6947	0.243626	No	-0.6451	0.259443	No

Kolmogorov-Smirnov Test For Different Distributions

Alternative Hypothesis	Dmn Criterion Value	Reject H0 if Greater Than	Test Alpha Level	Reject H0 (Test Alpha)	Prob Level
D(1)<>D(2)	0.292308	0.6483	.050	No	0.8492
D(1)<D(2)	0.030769	0.6483	.025	No	
D(1)>D(2)	0.292308	0.6483	.025	No	

Plots Section

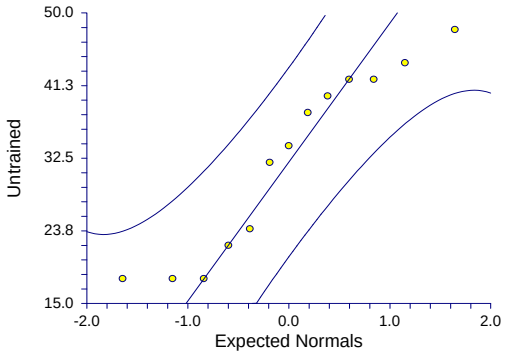




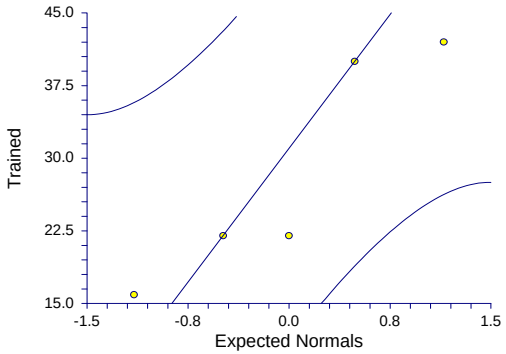
Two-Sample Test Report

Page/Date/Time 3 10/30/2009 3:21:25 PM
Database \\sasdfls03\profilesb$\zwane ... CSS 2007\Report\Data only.S0

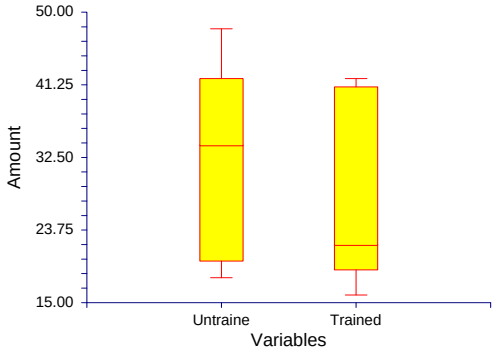
Normal Probability Plot of Untrained



Normal Probability Plot of Trained



Box Plot



Appendix 7: Hypothesis 2 statistics report

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

One-Sample T-Test Report

Page/Date/Time 1 10/30/2009 3:34:54 PM
Database \\sasdfls03\profilesb$\zwane ... \Report\Trained data only.S0
Variable Trained

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Standard Error	95.0% LCL of Mean	95.0% UCL of Mean
Trained	5	28.382	11.80507	5.279387	13.72407	43.03993

T for Confidence Limits = 2.7764

Tests of Assumptions Section

Assumption	Value	Probability	Decision(.050)
Skewness Normality	0.0000		
Kurtosis Normality		1.000000	Cannot reject normality
Omnibus Normality			
Correlation Coefficient			

T-Test For Difference Between Mean and Value Section

Alternative Hypothesis	T-Value	Prob Level	Reject H0 at .050	Power (Alpha=.05)	Power (Alpha=.01)
Trained<>35	-1.2536	0.278273	No	0.164007	0.041135
Trained<35	-1.2536	0.139136	No	0.274969	0.075678
Trained>35	-1.2536	0.860864	No	0.003239	0.000520

Nonparametric Tests Section

Quantile (Sign) Test

Null Quantile (Q0)	Quantile Proportion	Number Lower	Number Higher	H1:Q<>Q0 Prob Level	H1:Q<Q0 Prob Level	H1:Q>Q0 Prob Level
35	0.5	3	2	1.000000	0.500000	0.812500

Wilcoxon Signed-Rank Test for Difference in Medians

W Sum Ranks	Mean of W	Std Dev of W	Number of Zeros	Number Sets of Ties	Multiplicity Factor
3	7.5	3.691206	0	1	6

	Exact Probability		Approximation Without Continuity Correction			Approximation With Continuity Correction		
Alternative Hypothesis	Prob Level	Reject H0 at .050	Z-Value	Prob Level	Reject H0 at .050	Z-Value	Prob Level	Reject H0 at .050
Median<>35			1.2191	0.222801	No	1.0000	0.278517	No
Median<35			-1.2191	0.111400	No	-1.0837	0.139259	No
Median>35			-1.2191	0.888600	No	-1.3546	0.912223	No

One-Sample T-Test Report

Page/Date/Time 2 10/30/2009 3:34:54 PM
Database \\sasdfls03\profilesb$\zwane ... \Report\Trained data only.S0
Variable Trained

Plots Section