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GLOSSARY OF ABBREVIATIONS

Abbreviation	Meaning
B2B	Business-to-business
CSCMP	Council of Supply Chain Management Professionals
CAT	Credit Accumulation Transfer
CSIR	Council for Scientific Industrial Research
ETD	Education, training and development
ETQA	Education and Training Quality Authority
HEQC	Higher Education Quality Council
HR	Human resources
HRD	Human resources development
HRM	Human resource management
NQF	National Qualifications Framework
NSA	National Skills Authority
NSB	National Standards Body
OBE	Outcomes-based Education
OL	Organisational learning
QCTO	Quality Council for Trade and Occupations
SAQA	South African Qualifications Authority
SC	Supply chain
SCL	Supply chain learning
SCM	Supply chain management
SDA	Skills Development Act
SDF	Skills development facilitator
SETA	Sector education training authority
SGB	Standards Generating Body
SMMEs	Small, medium, micro enterprises
TNA	Training needs analysis
WSDP	Workplace skills development plan

CHAPTER ONE   INTRODUCTION

1.1.   **INTRODUCTION**

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1.1. INTRODUCTION

Skills shortages amongst South African supply chain (SC) organisations appear to be one of the top five challenges facing the industry (SupplyChainForesight, 2008: 2). This is a multidisciplinary study that combines supply chain management (SCM), adult education, human resource management and training. Far too few research studies currently focus on the SCM training needs of industries despite the need for supply chain skills and capabilities. The research intent is to use a research questionnaire to test the perceptions of training needs held by supply chain managers and non-managerial employees. The outcome would provide a means of addressing any identified gaps in training needs analysis. Deductions made from the literature review can best be presented in the form of the problem statement below.

1.2. PROBLEM STATEMENT

The 2008 Barloworld-University of Stellenbosch study concluded that one of the top five challenges facing industry is the existing lack of skills and capabilities of SC staff (SupplyChainForesight, 2008: 14). The Council for Scientific and Industrial Research (CSIR) follow-up study stated that the previous labour training programs have been less than successful. The CSIR recommendations urged that future training needs be analysed by placing more emphasis on assessing training requirements (Logistics News Case Study Annual, 2009: 11; Bushney & Meyer, 2008: 19). The CSIR study shows that South African practitioners worry that their current SCM skills shortage will hamper economic development and progress, if not addressed as a matter of urgency.

In the South African marketplace the current gap between skills demand and supply is due to many factors, which include:

- Confusion as to whether skills are scarce, critical or both. The resultant demand estimates for certain skills are therefore not very certain (Erasmus, J. 2009:2).

- Skills migration on the demand side: skilled staff have been attracted by overseas companies (Sydhagen & Cunningham, 2007:129).

- Production of newly qualified graduates with skills irrelevant to the needs of industry (Letseka, 2009: 89).

- The preponderance of under-qualified Apartheid legacy staff (on the supply side) that need to be upskilled to equip them for existing jobs. This is a slow process since 81% of the 12.8 million currently employed have secondary and less-than-secondary levels of education (Erasmus, et al., 2007: 125).

- South Africa's preparations to host the 2010 FIFA World Cup football tournament placed strain on the SCM system, thereby highlighting the serious skills shortages more than ever (King, 2007: 10).

Training alone cannot instantaneously eradicate both demand and supply side skills shortages. Although by itself, training is a useful intervention, it has nevertheless been encumbered by problems. Some of these problems relate to the following:

- For decades, managers have been slow to send staff on training courses (Opperman & Meyer, 2008: 3)

- When employees were allowed to go on training, they struggled to transfer skills and apply the new knowledge to their workplace. This increased employers' reluctance to send other employees on subsequent training (Opperman & Meyer, 2008: 3)

- While some sectors of the economy train parts of their workforce, this does not necessarily include everyone who has training needs (McGrath & Patterson, 2008: 305)

  - Many employees are sent for low-level National Qualifications Framework (NQF1) training, which is not necessarily the training that business entities need (McGrath & Patterson, 2008: 302)

  - South African human resources (HR) practitioners pride themselves on spending 3% of their budget on training, although this translates to only R3613 on average per employee per annum (Bushney & Meyer, 2008:16)

- Training is done for administrative and legal compliance purposes, not necessarily for what the training needs are (Bushney & Meyer, 2008:16)

As a result of the problems mentioned above, Sector Education Training Authorities (SETAs) for all sectors of the economy confirm that many skills development levies are not claimed back since business enterprises are not training enough employees. During 2001/2002 only 21% of the 120225 firms who had paid their skills development levies claimed back the funds for training they had completed (Human Sciences Research Council, 2004).

This research aims to measure whether gaps exist between the training needs as perceived by SC managers and training needs as perceived by lower level, non-managerial staff. In the training context, a need is defined as a gap between a perceived state of training (the current situation) and the perceived future situation. Opperman and Meyer (2008: 3) state that inadequate training needs analysis (TNA) is done before and after actual training. Clearly this mismatch of SC training priorities will not be solved easily. This research will not identify training need gaps to foster the development of better training courses. By taking stock of relevant supply chain (SC) training need perceptions, the researcher hopes that the research will contribute to understanding the urgent national training requirements better.

1.3. RESEARCH QUESTIONS

In the light of the macro-environment described for supply chain personnel, the research questions are derived.

THE PRIMARY RESEARCH QUESTION IS STATED AS FOLLOWS:

Which gaps exist and why do they exist between the perceptions of training needs held by management and employees within the supply chain management (SCM) environment?

TH SECONDARY RESEARCH QUESTIONS ARE:

1.3.1. Which variables influence the perceptions of training needs held by South African SCM managers and employees respectively?

The constructs under investigation include the types of training, which refer to computer software training, contract management, financial management, negotiation skills, new product training, occupational health and safety, people skills, stress management, supervisory skills, time management, transport, distribution and warehousing skills. The research constructs also included existing educational qualifications, gender, the respondents' career stages, the duration of their current job tenure, signing a contract before training considerations, a list of demotivating elements and a list of motivating elements**.**

1.3.2. Which variables influence the perceptions of employees contrasted against the perceptions of managers? I need to explain why I wanted to investigate this aspect. The constructs under investigation will be the same as stated above, which include the types of training, existing educational qualifications, gender, the respondents' career stages, the duration of their current job tenure, signing a contract before training considerations, a list of de-motivating elements and a list of motivating elements**.**

1.3.3. How does the training content on previous courses that respondents have already attended differ from what they perceive to be future training content requirements? It is important to note that these sections were open-ended questions. The answers were reported only to their respective business organisations and are confidential. This was a requirement that the researcher had to adhere to, in return for having access to employee groups in the second phase of the research project.

1.4. RESEARCH OBJECTIVES

The research questions are translated into the following nine research objectives, namely to:

- determine whether there is a difference between managers' and employees' types of training that were attended in the 12 months prior to the study.

- determine which format of training is preferred by respondents

- determine the extent to which identified reasons motivate employees to attend training

- determine the extent to which identified reasons demotivate employees from attending training

- assess whether existing educational qualifications have any relationship with respondents' demand urgency for training

- test the perception whether females are offered more training opportunities than males

- determine if late-career-stage employees (older than 45 years of age) are less likely to request training than earlier career entrants

- establish the relationship, if any, between current job tenure (i.e. the duration with the same organisation) and the willingness to attend training

- ascertain whether employers' insistence that employees sign a contract will deter them from requesting more training

1.5. RESEARCH HYPOTHESES

For the sake of continuity and overview, the nine hypotheses that were derived from the literature search are stated here. Note that the theory on which the nine hypotheses are based will be highlighted as the reader progresses through the historical scholarly views. The hypotheses will appear in the condensed literature review chapters on **Education, Training and Development** (Hypotheses 2, 5, 6,7, 8 and 9); **Training needs analysis** (Hypotheses 1,3,7,8, and 9) and **Supply chain management** (Hypotheses 1-9).

Derived from the literature review and the aforementioned research questions and objectives, the research hypotheses (denoted H1 to H9) are as follows:

$H1_0$:   There is no significant difference in the training received by managers and employees in the preceding 12 months.

$H1_A$:   There is a significant difference in the training received by managers and employees in the preceding 12 months.

$H2_0$:   There is no significant difference in the opinion of managers and employees with regard to the preferred formats of training for employees

$H2_A$:   There is a significant difference in the opinion of managers and employees with regard to the preferred formats of training for employees

$H3_0$:   There is no significant difference between managers' and employees' perceptions regarding the reasons motivating employees to attend training

$H3_A$:   There is a significant difference between managers' and employees' perceptions regarding the reasons motivating employees to attend training

$H4_0$:   There is no significant difference between perceived reasons demotivating managers and employees from attending training

$H4_A$:   There is a significant difference between perceived reasons demotivating managers and employees from attending training

H5$_0$ There is no relationship between existing educational qualifications and urgency for employee training

H5$_A$:   There is a relationship between existing educational qualifications and urgency for employee training

H6$_0$:   There is no gender-based difference in the perception that female employees receive more training than males

H6$_A$:   There is a gender-based difference in the perception that female employees receive more training than males

H7$_0$:   There is no difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

H7$_A$:   There is a difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

H8$_0$:   There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

H8$_A$:   There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

H9$_0$:   Employees are not likely to request more training when employers insist on a repayment contract

H9$_A$:   Employees are likely to request more training when employers insist on a repayment contract

The nine hypotheses were tested, using more than one variable to describe the constructs in the three questionnaires. Chapter five contains more

information about the questionnaire design, while the research findings on each hypothesis are located in chapter six.

1.6. IMPORTANCE AND BENEFITS OF THE STUDY

The importance and benefits to be derived from this research study must be seen in the light of the existence of the Labour Department's scarce-skills listing. In the last five-year cycle (2004-2009), the list has become more comprehensive, indicating that training programs are not achieving the desired effect. Currently, there is a gap between trained employees demanded and those supplied, which is a normal economic phenomenon. However, while training is being done, evidence that TNA are done before sending employees on training courses, is not substantial (CIPD, 2008:1). Due to this omission, there is the risk of wasting resources (time and money) that arises from the misalignment of training programs. Training needs analysis is the first step towards designing effective SCM training programs in the future (beyond 2012), yet performance appraisals currently tend towards informal discussions on training (CIPD, 2008: 2). This could lead to possible demotivation of employees and lack of economic growth in the long run.

The world economies are currently trying to deal with repercussions from the 2008 recession and literature points out that training should be provided now to anticipate the later upswing in the economy (Marlborough, 2003:20). South African firms are also under a legal obligation through the National Qualifications Framework to train or re-skill employees before deciding to retrench them. Therefore TNA is imperative to guide training programs to be implemented. The research study design and methodology follows based on the important assumptions of recovery from recession and NQF adherence.

1.7. RESEARCH DESIGN AND METHODOLOGY

This section discusses the different parts of the research methodology and the plan to collect the empirical data required for analysis. The in-depth discussion on design and methodology appears in chapter five.

1.7.1. DESCRIPTION OF OVERALL RESEARCH DESIGN

This section describes the overall research design, which is the general approach to the data collection and data analysis in order to attain the research objectives mentioned above. By using the "onion" of research approach as illustrated by Saunders, Lewis and Thornhill (2007:132), the discussion starts at the core of the onion and proceeds outwards as shown in Figure 1.1 below:

In Figure 1.1 the legend explains that levels 1-5 of the research onion refer to the time horizon of the research study, the methods to be used, the research strategy to be used, the approach between inductive and deductive reasoning and finally the research philosophy respectively.

Figure 1.1.   The research onion


```
                                                    LEGEND:
                                                    Levels(numbers) =
                                                    Explanations

         Research              3                    1.  Time  horizon  of  the
         design        1                                research study
                    2              4                2.  The research method
                                        5          3.  The research strategy
                                                    4.  The research approach
                                                        being either inductive or
                                                        deductive reasoning
                                                    5.  The research philosophy
```
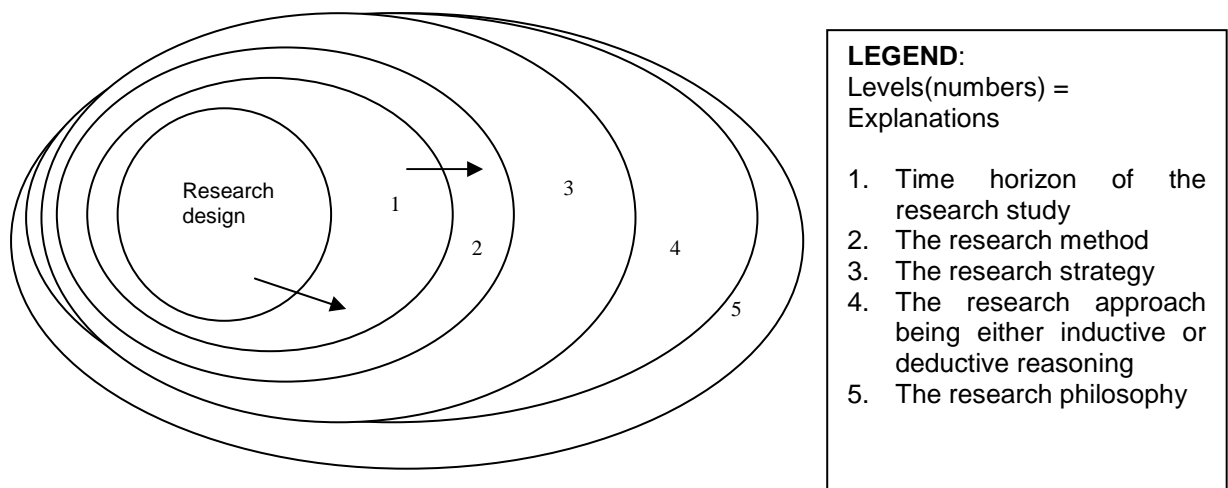
Source: Adapted from Saunders, Lewis and Thornhill (2007:132)

From level 1, the time horizon of the research study will be cross-sectional, not longitudinal, since empirical data will be collected at a particular point in

time (Saunders, *et al.*, 2007: 146, Leedy & Ormrod, 2005: 142). Cross-sectional studies apply when using a questionnaire for data collection since it reduces the amount of time to be physically spent in the business organisations that form part of the research sample.

At level 2, the mixed method of research will be followed. This method uses quantitative and qualitative data in parallel data collection and analyses without changing the data (Saunders, *et al.*, 2007: 145). This decision is based on the purpose of the research, which is to provide both descriptive and explanatory answers to the research questions. Mixed methods are not to be confused with mixed model research since the research intention is not to take quantitative data to turn them into qualitative data nor to take qualitative data and turn it into a quantitative data approach (Saunders, *et al*, 2007: 146). Exploring the academic literature available on the topic made it clear that gaps exist in the knowledge and context of the South African SC organisations. Since the focus is on using the findings to establish relationships between variables both qualitative and quantitative data may prove useful (Saunders, et al. 2007: 134).

Level three of the research onion involves deciding on the research strategy from the choices of experimental design, surveys, case studies, action research, grounded theory, ethnography and archival research according to Saunders, *et al.* (2007:135). Data findings cannot be extrapolated from case studies. This proposed study will apply both the survey method and a comparative strategy for the empirical data collection (Leedy & Ormrod, 2005:108). Time and cost implications also prohibit the use of too much qualitative data, which would result from an ethnographic approach. Therefore the proposed study will use the survey research strategy that allows a contribution to be made to the existing literature with the most efficient use of limited resources.

Surveys are popular research designs since they allow for the collection of large volumes of data from the population without a commensurate financial expense. The method is not without its associated difficulties since the
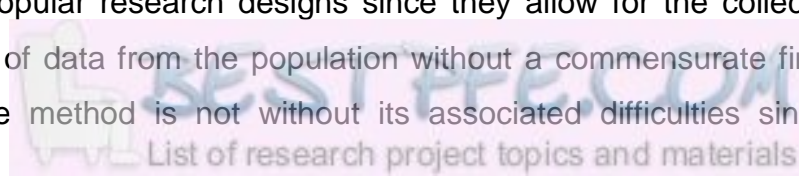
researcher is dependent on the goodwill of others for the completion of the questionnaires. Data capturing and the subsequent analysis involved in the survey method also consume considerable time. The literature reviewed, indicates that leading SC researchers such as Gattorna used the survey method with great success (Gattorna & Clarke, 2003). Grant (2001: 574) in his training courses also applied "before and after" questionnaires. Although telephonic surveys were used in some research studies, the proposed study will electronically distribute questionnaires (TNA1) in phase 1 in order to reach the maximum possible number of respondents. More is said about distribution of questionnaires in the section on sampling below.

Level four of the research onion, is concerned with the choice between a deductive and an inductive research approach. This study uses the deductive approach since conclusions will be made after the literature is reviewed and the empirical results have been analysed. In the proposed study, the contents of the e-mailed survey and the data collection conducted on the premises of respondents will be based on information collected from the literature findings.

The research philosophy followed for this data collection, which is the fifth layer of the research onion, falls into the realm of epistemological critical realism since it is a multilevel study including the levels of individual respondents, their groups and their organisations. No data collected can be completely objective in order to achieve direct realism. The researcher should therefore steer away from personal values to avoid judging respondents according to the discussion by Saunders, *et al.* (2007:104-110).

The overall research design can briefly be summed up as being empirical, applied, evaluative, cross-sectional and comparative. Survey methods are used for the purposes of collecting primary data from respondents that will be both numeric/quantitative and non-numeric/qualitative in nature. All the choices made in levels 1- to 5 in the research onion approach, will require further discussion of the sampling techniques and data collection method to be followed. This section is delineated next.

1.7.2. SAMPLING

A sample is selected since the research study cannot elicit a response from every supply chain member or employee in the entire South African population. The units of analysis are people employed in any organisation with a supply chain structure connection or who are members of the associations listed below. The sampling procedure was divided into two phases:

Phase 1: An electronic questionnaire will be distributed via the databases of the participating SC professional associations:

▪ the Chartered Institute of Purchasing and Supply Southern Africa (CIPS)

▪ the Chartered Institute of Logistics and Transportation Southern Africa (CILTSA)

▪ the Association for Operations Management of Southern Africa (SAPICS)

▪ Commerce Edge (Pty) Ltd, a procurement solutions company

These professional bodies form a purposive sample, given that some of them may have participated in a previous research study and have a professional sense of goodwill towards academic research. They are also representative of the South African supply chain practitioners, and this provides credibility to the proposed research study. The sample size will depend on the number of questions contained in TNA1 and must satisfy inferential statistics requirements.

Phase 2: On-site sessions were arranged where groups of between 20 and 30 respondents were exposed to the generic training pitch on introductory SCM concepts. Respondents were requested to complete before-and-after questionnaires (TNA2 and TNA3). This phase of the research study represents a comparative design since it is not completely random in its selection of target respondents (Leedy & Ormrod, 2005:108, Cooper & Schindler, 2003: 428)

The reason for using phase 2 for the intervention can be explained by Denyer & Tranfield, (2003: 682). The new approach to question formulation states that context is important for understanding what my results are worth. Interventions in my study context will impact on the following contextual layers:

a.   the individual employee

b.   their relationships

c.   the organisations where they work

d.   wider systems

My intervention of Interest is focused on training from the past to determine where respondents are at. A training intervention about the necessity of training, moving up management hierarchies in order to make decisions one day about one's own work/life balance.

1.7.3. THE RESPONDENTS' PROFILES

The respondent profile differs for each phase:

Phase 1: These respondents are most likely to be SC practitioners who are in a managerial or supervisory function (within procurement, production, warehousing, distribution or customer service). Membership of a trade association such as CIPS, CILTSA or SAPICS, must be ascertained from TNA1. Trade union managers and SETA managing members who happen to belong to these associations are included here.

Phase 2: These respondents are more heterogeneous since they can be drawn from all levels of business organisations (i.e. non-managerial levels included).

In both instances it is irrelevant how long the respondents have been with the professional associations or employed in their current jobs. It is more

important that they have an equal chance of selection in either phase of the sample selection.

The reason for holding training sessions on the business organisations' premises (in any of the 9 provinces of South Africa) arises from time constraints involved in trying to relocate all respondents to the University of Pretoria for example. Most full-time or part-time employed respondents' view on training is that they can afford a week's vacation to go on a training course, but that anything longer in duration will prove to be inconvenient (Grant, 2001:583). This necessitates that TNA 2 and TNA 3 should take place in the same week but not on the same day for each organisation.

Letters of informed consent accompanied the questionnaires to ensure respondents agree to participate in the research project. This is intended to minimise the risk of unwilling participant complications from an ethical point of view.

1.7.4. DATA COLLECTION

The data collection plan includes more specifics about how to complete the survey and the premises that underlie the questionnaire design.

SURVEY METHOD

In order to gain access to the organisations of respondents, in line with Saunders, *et al.,* (2007: 174) surveys do have associated difficulties and therefore the entry strategy involves the following practical measures:

- Arranging for this proposal to be reviewed by an Ethics Committee towards the end of May 2011, allowed sufficient time to negotiate access with decision makers in subsequent months.
- Using existing contacts (from the researcher's 2007 completed Masters level research study) and developing new contacts in order to gain access.
- Providing a clear and concise explanation of the purpose of the research and what is expected of the participating respondent.

- Overcoming organisational concerns through dialogue and telephonic communication and/or using electronic mail facilities.
- Developing access incrementally, that is, understanding that the entire research sample will not agree to participate in one single day of asking for access, but over a number of weeks.

If all efforts failed to set up meetings with respondent organisations, a process of self-selection could have been used by advertising the research study in appropriate trade journals to allow respondents to volunteer themselves for participation. Fortunately this last resort was not required.

MEASUREMENT

The respondents were asked generic demographic information such as their main area of business responsibility, how long they have worked for their organisation and whether they rank as supervisors, managers or neither. If the questions are about gender, for example, the two-answer option makes it a dichotomous scale that will only yield nominal data.

Information regarding their individual exposure to training courses and programs was requested to compare the levels of learning amongst respondents. Thereafter respondents' perceptions regarding training provided were measured with a five-point Likert scale. The Likert scale is one variation of the summated rating scale where respondents can express a favourable (score of 5) or unfavourable attitude (score of 1) in response to statements about certain aspects of SCM training (Cooper & Schindler, 2003: 253).

Since data types are classified into four categories (nominal, ordinal, interval and ratio) they influence the methods whereby respondents' views can be statistically analysed (Cooper & Schindler, 2003: 223; Diamantopoulos & Schlegelmilch, 2002: 67). More of this will be discussed in the following section on questionnaire design.

QUESTIONNAIRE DESIGN

The research questionnaires TNA1 and TNA2 are in the Annexure section. They are based on the sections described above and incorporate questions raised by the literature reviewed. Each questionnaire also has the informed consent letter as cover page.

PRE-TESTING

In order to improve the reliability of the questionnaire, it was tested and re-tested amongst certain supply chain participants to see if they consistently answered questions in the same way (Saunders, *et al.* 2007: 367). Internal consistency was checked by correlating questions within the questionnaire with questions rephrased elsewhere in the questionnaire.

In order to assess both content and sampling validity the pilot study had to discover any problematic questions by using the respondent group that closely resembles the targeted sample group (Diamantopoulos & Schlegelmilch, 2002:34). Any feedback received served as input into refining the research instrument before administration in field (Saunders, *et al.,* 2007: 387). More will be said about validity and reliability in the research methodology section (chapter five) which follows in due course.

1.8. DATA ANALYSIS

The coding of the research questionnaire answers was done in consultation with the data analysts in the Department of Statistics at the University of Pretoria. Data were captured on Excel spreadsheets to yield matrices about specific variables. The data were stored electronically after being printed out in paper format and coded. Only questionnaires that were completed in full were used for data analysis to prevent having to set rules for incompleteness.

The sequence of events involved in the data analysis process, are divided into stages as follows:

Data Analysis Stage 1

- Cleaning input and processing TNA1 responses obtained from organisations and arranging new times and dates to run the SCM training pitch.

Data Analysis Stage 2

- Applying TNA2 on site and amongst ordinary workers, before implementing the SCM training pitch.

- Applying TNA 3 after a few days to allow reflection and processing completed questionnaires to identify and measure all training gaps.

Statistics of location and variability will help to describe the data in terms of the mean (average) and the standard deviations from the mean. Factor analysis will be used to test the face validity of the questionnaire by detecting underlying dimensions that explain relations between multiple variables (Statsoft, 2008). Measures of relationships or correlation between variables can indicate whether the relationship is positive or negative and whether it demonstrates strong or weak correlations. A score of +1 or −1 would indicate a perfect correlation, which means that knowing the value of one variable can allow the other to be predicted (Leedy & Ormrod, 2005:265, Cooper & Schindler, 2003: 578).

While it is relatively straightforward to compare the results of two variables such as the level of training with the level of satisfaction about the training (using Chi-square tests of two variables) the decisions to conduct test of relationships require proof of non-correlation between variables. Multivariate techniques such as regression analysis can therefore be applied to the dataset at a later stage. Hypotheses tests will be conducted at between 95 and 99% levels of confidence to find statistically significant relationships. These data analysis techniques are also closely linked to the size of the sample of respondents. If the data set is too small, only non-parametric tests can be conducted (Statsoft, 2008).

1.9. ASSESSING VALIDITY AND RELIABILITY

This study proposes the use of a research questionnaire that was derived from literature reviewed and adapted for the purposes of reaching the set objectives. There is therefore a need to assess the reliability and validity of the questionnaire before trying to recommend any new approach to TNA after the empirical data have been analysed.

Reliability refers to the extent to which the data techniques and analysis procedures are able to yield consistent results (Saunders, *et al*.: 2007: 149). There are four threats to the reliability of research findings that include subject/participant's error, respondent bias, and observer error and observer bias. Relationships between variables and any instance of predictability, can only be assessed when dependencies have been established and the reliability and validity of the data have been verified in a factor analysis (Cooper & Schindler, 2003: 234).

Validity forms can be external or internal according to Cooper & Schindler (2003: 231). The external validity of research findings refers to the data's ability to be generalised across persons, settings and times. Internal validity is limited in this study to the ability of the research instrument to measure what it thinks it is measuring.

In order to improve the likelihood that the research study is actually measuring what it thinks it is measuring (i.e. that the questionnaire is valid) it is important to distinguish between the various validity assessment approaches. The validity approaches deal with content validity, criterion validity and construct validity of which the latter is the one that must be proved before the research will be able to contribute to the supply chain management (SCM) literature and communities. Construct validity is an indication of how the research findings can be generalised from the sample to the rest of the business population (Saunders, *et al.*, 2007: 51). Pre-testing of the questionnaire was done to ascertain construct validity before in-field testing took place.

1.10. DELIMITATIONS AND ASSUMPTIONS

This research is based on the foundation of business management, specifically SCM as the main underlying discipline. The findings of the research are not intended to become a prescription for further and higher education and training, or of HR management in the South African marketplace.

The proposed research is not aimed at small medium and micro enterprises' (SMME) sole proprietorships since it targets organisations with more than 10 employees. This delimitation in focus is supported by findings that training initiatives are implemented after training needs analysis (TNA) of entire businesses. Smaller concerns have been found not to have formal training programs in place and therefore request less formalised training (Frazis, Gittleman & Joyce, 2000: 444; Barcala, Martin & Gutierez, 2000: 244).

Although we assume that emigration or brain drain out of South Africa aggravates skills shortages, its causes cannot be ascertained through this particular research project. Reasons for emigration have been speculated to include high crime levels, worsening public service delivery and expensive living conditions. There is however no proven direct link between brain drain and supply chain practices. Thus this research study similarly does not aim to prevent future brain drain through its findings on training needs perceptions (Human Sciences Research Council, 2004).

This research study further assumes that:
- respondents participate out of informed consent
- research respondents may remain anonymous even after the research is completed
- all information will be provided in good faith
- all measures must be put in place to ensure confidentiality of incidental findings about participating business organisations

Based on the delimitations and assumptions above, the research ethics are expounded on in the following section.

1.11. RESEARCH ETHICS

The general ethical issues that apply to respondents at the data collection stage, involve obtaining their informed consent; keeping their identities private and their answers confidential (Saunders, *et al.,* 2007: 180). The researcher will not offer any incentives for participation and no respondent will be targeted under the age of 18. The contact details of respondents for Phase 1 of the survey will remain at the discretion of the relevant professional associations and not be accessible to the researcher at any given time. Any organisation willing to proceed to Phase 2 of the research will remain anonymous towards their competitors.

The signed letters of consent will be kept on file for a period of two years after the study is completed and subsequently disposed of responsibly. A copy of the letter of informed consent is included in the Annexure. No respondents will in any way be embarrassed during the data collection or coerced into not changing their mind at any time during the course of the research data collection.

The application for ethical clearance was presented to the Ethics Committee of the University of Pretoria for approval before distributing the questionnaire into the field.

Since the approval was granted, the chapter outline highlights what to expect for the rest of this report.

1.12. CHAPTER OUTLINE

The outline of the chapters of the research report is as follows:

Chapter 1: Introduction

This chapter served as a synopsis and overview of the entire research project.
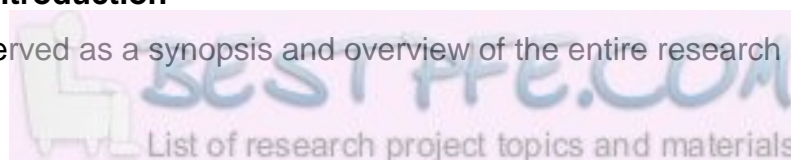
Chapter 2:   Education, training and development (ETD)

This chapter explains why the research focused on the training aspects of the supply chain industry, as opposed to government supplied education. Since development is also long term in duration, the shorter training aspects matched the cross-sectional nature of the study. The South African ETD environment is briefly touched on.

Chapter 3:   Training needs analysis (TNA)

The concept of training needs analyses and its business staff context is discussed in this chapter.

Chapter 4:   Supply chain management and training

The supply chain management history and its subsequent need for continuous training are explained. This is accompanied by a global business context.

Chapter 5:   Research design and methodology

This chapter contains more specific reasons why the research design, methodology and analyses were followed.

Chapter 6:   Research findings

This chapter provides descriptive information about the respondents and evidence linked to each of the nine hypotheses.

Chapter 7:   Conclusion and recommendations

This chapter revisits the original deductions made about the study and recommends future research directions.

Figure 1.2. summarises the logic of the research study where the aim is to identify gaps between the respondent groups.

Figure 1.2.   The research model
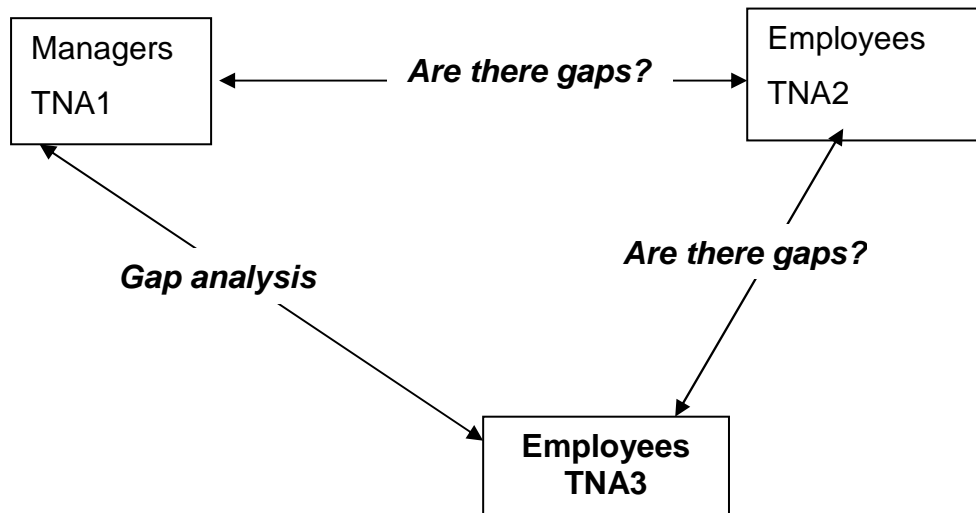
1.13. CONCLUSION

This chapter introduced the reasons that motivated the research to be conducted.   Training needs analysis is merely the forerunner towards designing training programs in organisations. The respondents were asked to provide information based on theory underlying the hypotheses tested by the questionnaire design and analysis, thus the literature review follows in subsequent chapters.

CHAPTER TWO   EDUCATION, TRAINING AND DEVELOPMENT (ETD)

2.1.   INTRODUCTION

"A nation at work for a better life for all"

(Erasmus, Loedolff, Mda & Nel, 2007: 61).

This quotation represents the vision of the national human resource development (HRD) strategy and states that the South African government considers its people to be the most valuable economic resource. It stems from the strategic point of view that relevant legislation will create institutions to support this vision to realise maximised HR potential.   By acquiring knowledge and skills, South Africans are supposed to compete productively in a global economy whilst enjoying a rising quality of life for all (Erasmus, *et al.*, 2007: 61).

This chapter delves into the issues surrounding education, training and development (ETD) in the South African and global context. The chapter's point of departure is that individual ETD adds to business learning and will ultimately impact collectively on business and supply chain (SC) practices. Erasmus, *et al.* (2007:3) believe education to be generally long term and that it should be provided by the government. Training is seen as short term and is provided to an individual employee according to business objectives. Development is seen as presenting opportunities collectively to enable an entire workforce to grow according to specific business strategies (Erasmus, *et al.*, 2007: 3).

Functions of ETD are seen as the predominant responsibilities of the human resources (HR) practitioner who implements organisational strategies according to Botha and Coetzee (2007: 48). This HR responsibility applies to private, public, for profit and nonprofit organisations alike. Having the right talent, in the right place, at the right time is what the ETD and labour market should strive to implement.   However, before "getting it right", talented individual HR arrive at organisations with some basic educational background and negotiate with employers to receive further training. Over time, employed HR can develop into useful, effective and efficient resources in their organisation's business practice.   Ideally, all employees' personal training

needs will also be met. Each component of ETD will be discussed separately in the following sections, together with the South African ETD context. The ETD requirements for SC will be included later.

2.2. EDUCATION

" … in the developing world, education is widely viewed as being the key to individual and collective success" (Smith & Yolisa Ngoma-Maema, 2003: 345).

South Africa and many nations in Africa are still considered as 'developing', and not "developed" worlds. In contrast to the quote above, the developed United Kingdom (UK), consisting of England, Wales, Scotland and Ireland; do not perceive themselves to be above other ETD requirements. The UK saw a need for "something more" in their 2010 education research report. The UK government is calling for a pervasive culture of learning. This means that all sections of the UK society should see ongoing learning as part of their lives, not just something that has to end with compulsory education (McQuaid, Lindsay & Johnson, 2010: 9). Needless to say, the views about education will differ from one country to the next, depending on the broader economic scenarios existing everywhere. The ETD literature review that constitutes this chapter, includes findings from both developing and developed countries' perspectives in order to remain objective.

Education is seen as the process of acquiring the skills, knowledge and attitudes that humans need in order to function in their normal way of life, according to Erasmus, *et al.,* (2007: 2-3). The Oxford University Press defined education as an intellectual and moral training act (Hornby, Cowen & Gimson, 1986: 276). Further back in time, in 1952, there was a debate on the issue of "what education is?" between Harold Benjamin and Robert Hutchins, renowned scholars of that time. According to Benjamin, education is an organised and conscious effort to change human behaviour (Benjamin & Hutchins, 1952: 28). However, Hutchins was convinced that education has the distinct objective to teach people or help them to learn, to think for themselves (Benjamin & Hutchins, 1952: 31).

While Hutchins perceives the entire educational system as being there to help people learn to think, Benjamin sees educational concerns as searching for instruments, activities and tasks to establish the required behaviour change in learners (Benjamin & Hutchins, 1952: 28). Although each learner in education is unique, the teacher has to fit the activities and tasks to each learner as well as matching it with the relevant societal requirements. This complicates the decision since people have to decide what changes they want to see in society and how much freedom they can allow individuals to have in furthering their own personal goals (Benjamin & Hutchins, 1952: 29).

The next question to be answered by Benjamin and Hutchins (1952: 29) was how best to encourage education. Benjamin thought all education should be self-operated in order to be effective. The role of the teacher was therefore to arrange experiences in which individual learners could learn to be or do something different from what they were – or had been doing. The teacher must clearly understand then, why the change is required and what changes they wish to effect (Benjamin & Hutchins, 1952: 23). However, Hutchins was convinced that change in learners should also be in the direction of their own ideals. If however, the learner could not reach the point of making that decision, that person will not be envisaged as receiving any education of any kind (Benjamin & Hutchins, 1952: 30). In this way, Hutchins concluded the debate by noting that the teacher should not take on any obligations other than to teach the learners to think for themselves (Benjamin & Hutchins, 1952: 32).

The question of whether education decisions lie with the learner/employee or with someone else remains. On this note, the Canadians pondered whether previous education played a part in the decision to attend further training. The adult education and training survey in Canada showed that on average more than 52% of the Canadian respondent staff took part in formal, job-related training around 2004. The Canadian survey found that if staff members already had a higher level of education (primary, secondary and post-secondary school levels), they were more likely to participate in training

courses and training programs in the workplace (Peters, 2004: 9, McQuaid, Lindsay & Johnson, 2010: 4). This view is supported by another UK survey in which McCracken and Winterton called the phenomenon the Matthias Principle. This focused principle on education states that "to those that hath shall be given" and therefore in contrast, those without education will receive less (McCracken & Winterton, 2006: 56). The two authors were concerned that the UK human resource development (HRD) policy contradicted its own goals. The UK planned lifelong learning to be widely practiced but, to the contrary, their skills development targeted specific occupations in which to address skills gaps and shortages in (McCracken & Winterton, 2006: 56). The UK research investigated barriers faced by mid-career managers that prevented them from pursuing further education and training opportunities. The scrutinised variables included age, gender, qualifications, career history and family circumstances (McCracken & Winterton, 2006: 60). These variables were compared to emotional, cognitive, motivational and perceptual factors in order to determine whether intrinsic or extrinsic factors prevented managers from continuously seeking out management development.

McCracken and Winterton found that the female respondents blamed corporate culture as the extrinsic barrier to their learning (2006: 63). The Pearson Chi-square test yielded significant differences in means at the 5% level (the means were 2.39 and 1.88 respectively). The authors found this to underline the sentiment that females were more aware of the need for continuous learning in a male dominated corporate environment (McCracken & Winterton, 2006:63). This UK study also concluded that mid-career managers, who stayed at the same company for their entire careers, were less likely to seek opportunities for formal training programs (McCracken & Winterton, 2006:63).

McCracken and Winterton strongly suggest that the experienced manager knew best that personal development would not, by default, be a means to rewards at their respective workplaces. Instead the job-based or task-based achievements could be perceived as being more worthy of reward than personal achievements (McCracken & Winterton, 2006:63). Although both

intrinsic and extrinsic barriers to learning were identified, the extrinsic factors such as poor corporate culture and reward structures as well as time pressures proved more likely to be managers' barriers. McCracken and Winterton advise organisations to improve their learning environments, make reward structures fair and introduce secondment and mentoring to eliminate barriers to managers' learning (McCracken & Winterton, 2006: 64). Since the McCracken and Winterton study involved only 61 managers within the UK life insurance industry, subsequent research should be conducted amongst a larger, more diverse group of companies.

The deductions that can be made from the aforementioned studies yielded the following hypotheses to be examined:

$H5_0$ There is no relationship between existing educational qualifications and urgency for employee training

$H5_A$: There is a relationship between existing educational qualifications and urgency for employee training

$H6_0$: There is no gender-based difference in the perception that female employees receive more training than males

$H6_A$: There is a gender-based difference in the perception that female employees receive more training than males

$H7_0$: There is no difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

$H7_A$: There is a difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

$H8_0$: There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

$H8_A$: There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

After questioning a total of 397 Turkish hotel service employees, it was thought that differences in education levels alone could explain gender wage differences. Yet it appears that the traditional societal role of women can also undermine their education and wage levels. In Turkey, society (and females themselves) perceives women in a traditional role of child caregivers. Females themselves therefore anticipate lower wages. It is likely that the reason for this expectation is acceptance of lower wages in exchange for receiving hotel accommodation and even for having the employment (Kara & Murrmann, 2011: 4). The Turkish investigation also enquired about respondent experience levels, age and marital status. All these variables together influence the wage differences. An additional conclusion drawn was that female (lesser educated) employees are also less job satisfied than their male colleagues (Kara & Murrmann, 2011: 4).

It appears that not only less developed countries can be influenced by educational qualifications. The importance of education cannot be underestimated since the Swedish study showed the real consequences of having less education than one's fellow employees. A longitudinal study conducted between 1986 and 2002 in Sweden demonstrated the effects of being educated or not, during the period when Sweden experienced an economic downturn at the start of the 1990s. Analysis of secondary data obtained from the Swedish Labour Market Policy Evaluation, Statistics Sweden and the Employment Register, was used to monitor job flows or worker transfers. The respondent establishments needed to have at least five employees (on average) consistently over the 17-year-long research period (Gartell, Jans & Persson, 2010: 207). The data of 3 million employees could be derived from the 110 000 Swedish establishments combined. For the period 1986 to 1989, the employee ages ranged between 16 and 64. Between 1990 and 2002, the ages ranged between 16 and 65 years (Gartell, *et al.,* 2010: 208). The authors found that not only were fewer jobs created for those with the least education but more jobs at the lower level were also destroyed during the period 1986 to 2002. This meant that, during recessions, fewer jobs were destroyed at more highly educated staff levels,

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than at lower levels of education (Gartell, *et al.,* 2010: 212). This finding must be understood within the employment protection legislation context that makes it costly for a Swedish firm to randomly fire employees (Gartell, *et al.,* 2010: 206). It appears that higher educational qualifications prevented job losses for the employees during the Swedish recession. This obviously places employees with less education at risk of being laid off first during recessions.

The influence of education on employment brings government's role in monitoring education and training under the spotlight. A 2003 study in the People's Republic of China showed that businesses with enough financial resources select highly educated new staff and continue to develop them further. Chinese businesses who cannot select the same type of candidates are usually also unable to provide the employees they do select with high quality training thereafter (Venter, 2003: 186). This means that those employees are in need of their government structures to educate them even after they gained employment.

The role of the government in education was challenged when the World Bank report of 1993 designated governments as the sole source of skills formation. The role of the government as the exclusive provider of ETD, was challenged by Ashton, Green, Sung & James (2002: 5). Ashton *et al.,* emphasized that a range of strategies they used linked up with the government focus. Their strategic research study shows that eight Asian countries accelerated their skills development in one generation of their population whereas industrialised countries usually took three generations (Ashton, *et al.,* 2002: 5). Amongst the eight countries, those rich in natural resources included Indonesia and Malaysia. The commercially dominant, free port service countries are Hong Kong and Singapore. The countries renowned for interventionist export-led economies include Japan, South Korea and Taiwan (Ashton, *et al.,* 2002: 7). The authors neglected to place Thailand in a specific category. Consequently the seven countries are divided into three types, according to their key characteristics.

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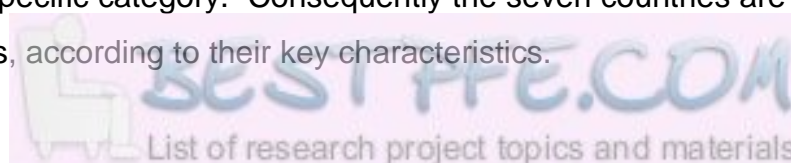
Ashton, *et al.,* 2002: 7 found that although Singapore, Taiwan and South Korea, accelerated their pace of skills formation impressively, their holistic industrialisation strategies inspired their distinctive education and training needs (Ashton, *et al.,* 2002: 6). These emerging economies experienced economic growth without skills shortages, since their governments co-ordinated the supply of skills (Ashton, *et al.,* 2002: 5). The abundance of unskilled labour is a competitive advantage only when the country is not trying to enter world markets via their labour force's technological capabilities (Ashton, *et al.,* 2002: 11).

Singapore, Taiwan and South Korea centralised control over their educational systems as a form of nation building in the late 1990s already. Curriculum control and moral education motivated public investments in education in order to help it deliver appropriate skills types and skill levels as industries required (Ashton, *et al.,* 2002: 12). By closing the loop, industries in these countries informed the educational systems despite Singapore having a smaller labour force than South Africa to educate (Singapore = 1.7 million). Having to move away from a strong agricultural base (like Taiwan), industries similar to South Africa included the three countries' governments successfully addressing skills shortages in steel, petrochemicals, electronics, chemicals, banking and finance (Ashton, *et al.,* 2002: 13). For the three countries, however the task of managing capital through borrowing instead of depending only on foreign direct investment started as early as the 1960s. State-owned enterprises in these countries led the way for industrialisation and some were privatised in later years. Unlike South Africa, emphasis was also placed on investing downstream in supply chains earlier (Ashton, *et al.,* 2002: 14). In conclusion therefore, it is not advisable for developing countries, by themselves, to seek to emulate the Asian countries' success in dealing with educational skills gaps. Instead countries, like South Africa should combine industrial and business strategies to allow marketplaces to signal the educational requirements more clearly.

All the same, elsewhere the role of providing education is still seen as being government policy and should therefore be the public sector's responsibility.

In the United Kingdom (UK), the public sector educational structures were meant to provide education until scholars started working and then pass on the responsibility for subsequent educational programs to employers (Roodhouse & Mumford, 2010: 325). Since 2006, the UK governments discovered that their approach alone was not working. They wanted to include higher and further educational institutions in providing employed professionals with further education. However the inclusive partnering was not working, due to employee perception that higher education institutions are out of touch, unresponsive to employer needs and impractical (Roodhouse & Mumford, 2010: 321).

The general consensus is that universities and employers do not speak the same language when it comes to education. There is however a positive finding from the UK study. The longitudinal UK study between 2008-2010 highlighted a new role in education for universities and institutions of higher learning. The new role is derived from the gap between employees who want accredited training to be provided and their employers who want unaccredited training. Fortunately, universities are the only institutions allowed to accredit other organisations to deliver their educational programs. Therefore the call to action persists for universities to help meet the educational needs of employees (Roodhouse & Mumford, 2010: 324).

Besides the archaic views of universities held by UK employees, there are other barriers to further education for employed people according to McQuaid, *et al.,* (2010: 8). Negative influences from peers and colleagues, early age educational disappointments, limited access to guidance, information and finance are barriers that prevent UK people from taking up opportunities to further their education (McQuaid, *et al.,* 2010: 8). The employers' attitude towards education can also determine how much will be transferred to the workplace by the person being educated or trained (McQuaid, *et al.,* 2010: 8, More, 2004: 38). Although the UK government removed the barriers by organising funding schemes, there are other societal influences that do not change overnight.

> The aforementioned studies on whether education is the responsibility of a country's government, the organisation or for the individual, led to the following hypothesis:
>
> $H9_0$: Employees are not likely to request more training when employers insist on a repayment contract
>
> $H9_A$: Employees are likely to request more training when employers insist on a repayment contract

Collectively it seems we cannot divorce education from the financial ability to pay, age and gender. Besides gender discrepancies in the workplace, there are other variables that impact on educational policy and indirectly on employment opportunities and job tenure. For a better understanding of the South African context, before the research project is discussed, the following section summarises sections of the educational history in South Africa.

2.3 HISTORY OF SOUTH AFRICAN EDUCATION

Currently South Africa has 11 official languages. Before 1994, only Afrikaans and English were officially recognised and used as the languages of instruction at basic education level (Walters, 1999: 223). Historically South Africans have been and currently still are, divided along lines of race. South Africans were previously mainly classified according to the colour (pigmentation levels) of their skin. Black people or natively born Africans now form the largest section of the population. Historically adult education in South Africa included the society, the state and the economy as the main actors (Walters, 1999: 220). Societal structures included trade unions, political organisations, religious groups, community-based organisations and tertiary education institutions. For thirty years, between the 1950s and the 1980s, government barred black adults access to education, going as far as opposing literacy education offered by nongovernmental and missionary groups (Walters, 1999: 221).

Basic education is offered at formal schools for learners between the ages of 6 and 17. This constitutes at least 12 years of education. Since education is considered first and foremost as a public good and in the interests of growth

for all, it is a legal requirement for all South African children to attend school. Since 1910, government invested minimal amounts in adult education since they could source immigrants from Europe with the necessary education (Walters, 1999: 221). In 1999, it was discovered that 50% of Black women only received seven years of schooling before starting to work as menial labourers in residential homes or factory environments (Walters, 1999: 220).

Further education (for technical skills) and tertiary education (for graduate education) had also been fragmented under the Department of Education across racially discriminating lines. According to Walters (1999: 218) the initial education that a person receives will influence the cumulative pattern of education throughout adulthood. One repercussion of the preceding Apartheid policy provisioning of poor quality basic education for some racial groups; is that some adults are not active learners later in life (Walters, 1999: 220).

Since the 1990s, when Nelson Mandela was released from prison and the African National Congress (ANC) political party was unbanned, the political landscape changed. New legislation was brought in by the Departments of Labour and Education to support the new HRD strategy vision and mission. These Acts appear in Table 2.1.

Table 2.1. The three ETD-related Acts and their main objectives

ETD-related legislation	Main ETD objective
South African Qualifications Authority (SAQA) Act No 58 (passed on 4 October 1995)	▪ to establish the SAQA institution ▪ to implement the National Qualifications Framework (NQF).
Skills Development Act 97 of 1998	▪ focused on assisting the SAQA Act and establishing Sector Education Training Authorities (SETAs).
Skills Development Levies Act 9 of 1999	▪ Introducing a compulsory levy to be paid to fund HR skills development in South Africa

Source: Adapted from Erasmus *et al.,* (2007: 68) and Van der Schyff (2003: 69).

The SAQA institution focuses mainly on the quality control of education and training through the NQF and setting national standards through the Standards Generating Bodies (Erasmus *et al.,* 2007: 72). The SAQA Board inclusively consists of trade union representatives, industry representatives, EDT service providers and non-governmental organisations (NGOs). The Skills Development Act (SDA) tries to integrate education and training with employment opportunities (Meyer, *et al.* 2003: 69). It established the National Skills Authority (NSA), National Skills Fund (NSF), SETAs, labour centers, Skills Development Unit (SDU) and allowed levy collection for grant-funding schemes (Meyer, *et al.* 2003: 77).   The NSA advises the Minister of Labour on national skills development policies to support the national skills development strategy (NSDS). From Figure 2.1 it should be clear that ETD takes place within organisations, industries and at national levels.

Figure 2.1. The national structures for ETD and skills development in South Africa.

Department of Education = SAQA Act

National level

Department of Labour = Skills Development Act (SDA)

South African Qualifications Authority (SAQA)

National Skills Authority (NSA)

National Standards Body (NSB) and NQF

Education Training Quality Assurer (ETQA)

Industry sector level

Sector Education Training Authorities (SETAs)

Sector planning process

Standards Generating Body (SGB)

Quality assessment, moderation & assessment

Education provided by:
* Schools=Basic education
* Universities and technology institutes =Higher education
* Colleges and private training providers =Further education

Organisational level

ETD and Skills Strategy is developed by the following enterprise level structures:
▪ Skills Development Facilitators (SDF)
▪ Workplace Skills Plans (WSP)
▪ Training committees

Source: Adapted from Van Der Schyff (2003: 68).

Within the framework of Figure 2.1, the 1994 first democratic elected government tried to eradicate the unequal opportunities for education. Since 1996, the new Constitution allows all South Africans access to free public school basic education and within reason, access to further education (Walters, 1999: 222). The SAQA and NQF were brought in to prevent the continuation of elitist practices in education (Walters & Daniels, 2009: 64). This means that higher education, schooling at all levels and vocational

training should now be included in one transparent and equally accessible system (Walters & Daniels, 2009: 64).

Currently, since 2009, the NQF has changed from eight levels to ten levels to allow more differentiation in higher education. Since the SAQA Act was signed into power 14 years ago, more adaptive changes meant that three Quality Councils have been formed. NQF levels 1 to 4 fall under the Quality Council for General and Further Education (called UMALUSI). Umalusi governs the quality in basic education (for a person's 13 years of education) and technical qualifications, under further education. The Higher Education Quality Council (HEQC) governs NQF level 5 to 10 in graduate degree programs. The Quality Council for Trades and Occupations governs the same NQF 5 to 10 levels for occupational qualifications (Walters & Daniels, 2009: 65). Every level of education is therefore accounted for.

The aims of the NQF will be discussed in greater detail in the section on development of skills. However according to Erasmus, *et al.,* (2007: 72) the principles underlying the NQF are as follows:

- **Integration**: Integration would ensure HR development leads to nationally acceptable qualifications
- **Relevance:** Nationally speaking, industry and individuals have needs that must be met through the NQF, while at the same time the advancement of knowledge, science and technology should be emphasized.
- **Credibility**: Local socio-economic priorities should not negate the fact that all ETD qualifications should have international credibility.
- **Coherent flexibility**: Coherent flexibility is required in order to meet the needs of industry, service sectors, service providers and trainees.
- **Guidance for learners**: Educators/trainers should be qualified to guide trainees
- **Recognition of Prior Leaning (RPL):** An example of RPL is that it would open the way for factory staff to become executives of their business organizations over time.

- **Portability**: At present this is not possible in South Africa. It refers to the way that trainees can transfer between academic institutions without losing credits
- **Progression**: Progression makes it possible for trainees to grow through the different levels of the NQF
- **Articulation**: Trainees should be able to migrate, on successful completion, to other levels in the system that join up to form a clear holistic training program.
- **Legitimacy**: All stakeholders should have a say in ETD program planning.
- **Standards**: The framework and outcomes should be agreed upon by all nationally and internationally.
- **Access**: In order to progress from one level to the next, everyone should have equal access to everything relating to ETD.

Conclusively the NQF is to provide a mechanism to ensure the following:

i. Certify workers' existing competencies
ii. Allow qualifications to count towards further qualifications
iii. Allow for matching (benchmarking) of qualifications obtained from different training service providers
iv. Allow workers to work towards qualifications, in periods of time (which can also be counted in unit standards)

The NQF works together with SETA subdivisions and serves to classify agricultural qualifications separately from management studies, law or health, for example. The implication for educational institutions and training service providers is that outcomes of courses must be clearly stipulated. They should use unit standards and specific outcomes to allow national comparison of qualifications and skills attained by workers.

The standardized way of recognising the educational qualifications of millions of South Africans is done via industry specific SETAs. These institutions focus on industry specific skills development and are described in Table 2.2.

Table 2.2. The South African Sector Education Training Authorities (SETA)

Abbreviation of the SETA name	Explanation of acronyms
1. FASSET	Financial and Accounting Services Sector Education and Training Authority
2. BANKSETA	Banking Sector Education and Training Authority
3. CHIETA	Chemical Industries Sector Education and Training Authority
4. ETDP	Education, Training and Development Practices
5. FOODBEV	Food and Beverages Manufacturing Industry Sector Education and Training Authority
6. HWSETA	Health and Welfare Sector Education and Training Authority
7. INSETA	Insurance Sector Education and Training Authority
8. MQA	Mining Qualifications Authority
9. AGRISETA	Agriculture Sector Education and Training Authority
10. PSETA	Public Service Sector Education and Training Authority
11. SERVICES SETA	Services Sector Education and Training Authority
12. TETA	Transport Education and Training Authority
13. CETA	Construction Sector Education and Training Authority
14. ESETA	Energy Sector Education and Training Authority
15. LGSETA	Local Government Sector Education and Training Authority
16. SASSETA	Safety and Security Sector Education and Training Authority
17. W&RSETA	Wholesale and Retail Sector Education and Training Authority
18. MERSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
19. ISETTSETA	Information Systems, Electronics and Telecommunication Technologies Sector Education and Training Authority
20. THETA	Tourism Hospitality and Sport Education and Training Authority
21. FPMSETA	Fibre Processing Manufacturing Sector Education and Training Authority
Where:	[This is an amalgamation of the previous MAPPSETA, CTFLSETA and FIETA]
MAPPSETA	Media, Advertising, Publishing, Printing and Packaging…
CTFLSETA	Clothing, Textiles, Footwear and Leather - SETA
FIETA	Forest Industries Education and Training Authority

Source: South African Qualifications Authority (2011.)

There are currently 21 SETA that use a percentage of the compulsory skills development levies for unemployed people's skills development. The SETA reimburses organisations that report on their delivery of skills training and development for their staff. Through the National Qualifications Framework (NQF), the SETA is able to measure and compare employees for the purposes of performance management.

For easier qualification comparisons to be made and for ETD return on investment (ROI) calculations, the SAQA has also listed generic Critical Cross-field Outcomes (CCFO). Regardless of industry, HR should possess the following CCFO:

- problem identification and resolution skills
- team and community skills
- locus of control
- communication skills
- responsible citizen skills
- understanding of how world systems relate
- ability to explore, learn and be entrepreneurial (Lancaster, 2001: 88, Meyer, *et al.*, 2003:36).

In the South African context, skills development is currently in a state of constant evolution. The first National Skills Development Strategy (NSDS) ran between 2004 and 2010 with a view to bringing about sustainable growth, development and equity (Erasmus, *et al.,* 2007: 62). The second NSDS began to run from 1 April 2011. The goal is to continue the alignment of skills development programmes with national growth strategies and to encourage lifelong learning for its citizens (Erasmus, *et al.,* 2007: 63).

Suffice it to conclude that the previous unequal access form of education is being addressed and the South African government is currently trying to integrate ETD concepts into one system. Since adults from the unequal access to education era are currently older and in employment, the following
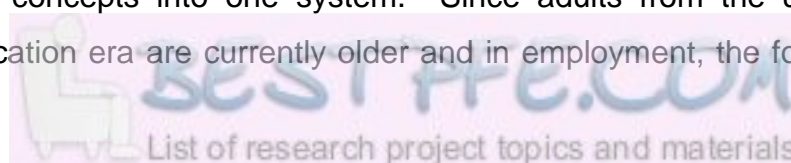
discussion takes a closer look at the definition of training (Meyer & Mokoele, 2003: 13).

2.4. TRAINING

Training is defined as the process of systematically altering the knowledge, skills and behaviour of employees to allow the workplace to achieve its objectives (Erasmus, *et al.,* 2007: 2). That means a change in the educational status of the employed people, since education refers to growth in skills, behaviour and attitudes above.   Although education is supposed to be "provided for all", training is seen as a deliberate, exclusive intervention by an employer on behalf of a particular employee (Meyer & Mokoele, 2003: 14). Classroom training, industrial theatre, outdoor training and computer-based training methods and techniques are all used for training purposes (Meyer & Mokoele, 2003: 4). Education is considered more long term in duration than training. Training has specific focus areas and narrows the subject matter down to skills required for specific business needs (Meyer & Mokoele, 2003: 14). Business training can be practiced on either new staff recruits or older staff. Training is also provided at various functional levels. It can vary from specialist staff, adults who need literacy training to managers who need further training for promotion requirements (Erasmus, *et al.*, 2007: 12).

The training process follows certain procedures that can include the following business practices (Erasmus, *et al.*, 2007: 11):

- An employer must have a documented training policy
- Job descriptions must include training responsibilities
- Training needs are to be regularly defined and redefined
- Training plans are to be drawn up and adapted
- Training resources should be provided
- Training plans must be executed
- Training results must be assessed after the training has taken place

Training programs must integrate with the business strategies, HR policies and overall direction of the organisation instigating the training (Erasmus, *et al.*, 2007: 20). Long term competitiveness, industrial turbulence and global SC dynamics require staff training to add to the overall corporate strategies and direction (Erasmus, *et al.*, 2007: 22). Yet, there are still misguided beliefs or myths about the place of training programs.

Training content and delivery mechanisms are under scrutiny due to some mythical notions, as set out by Hannum (2009: 27). These training myths state that:

- If employees are not performing well, they need training.
- Training and work should have separate spaces and times.
- Everything taught during training will be used on-the-job.
- More learning means better employee performance .

Hannum (2009:27) refutes these training myths in the following way. The real reasons for employee poor performance may include unclear expectations and lack of equipment/tools; not just training myths. Employees may struggle to connect what training provides with what they need on the job. For these reasons off-site training may not always be best. Since training programs cannot match work conditions exactly, employees struggle to transfer the training to practice. The best trainees will not automatically translate into the best job performers according to Hannum (2009: 27). He also highlights myths about training content:

- One size (training program!) fits all.
- Teach as much as possible about expert content.
- Great performers know what training to present.
- More training means more performance.

The preceding arguments led to devising hypothesis two:

H2$_0$:   There is no significant difference in the format of training preferred by managers compared to employees.

H2$_A$:   There is a significant difference in the format of training preferred by managers compared to employees.

Hannum (2009: 28): refutes the training content myths by stating the following:

- Employees must be tested for what they know and then trained accordingly
- Excess content will not trigger an employee to perform excessively well
- Star performers have intuition to perform well that may not have been transferred through training program development.
- There cannot be a proportional response to training: sometimes less performance can result from too much training.

Hannum (2009: 29) concludes that many training programs suffer from content bloatedness, where unnecessary content overwhelms employees. The danger of relying on training myths is that training programs are too long, cost too much and deliver none of the results anticipated. Besides training myths, some issues of diversity can also influence the joy derived by employees from job training.

A diversity study targeting 552 technical and customer service personnel in Canada and the United State of America (USA), yielded 302 respondents (Schmidt, 2009: 304). The Schmidt study wanted to assess how demographics and diversity of staff influence their satisfaction with training. The survey was responded to online (43%) and via printed copy (57%). Some of the sample descriptors were:

Female: 182 respondents =62%
Caucasian: 198 respondents = 69%

Between the ages of 20 and 35 years old: 171 = 57%

Completed college without a degree: 170 respondents = 57%

Permanent employees: 249 = 84%

The Schmidt study findings were analysed in response to two main research questions (Schmidt, 2009: 306). Question one asked if demographic variables (education, job tenure, age, gender and race/ethnicity) were related to job training satisfaction (JTS). It was found that employees employed at the organisation for less than a year were more satisfied and received an average of 10 days more training. Older employees averaged 9 to 13 days' worth of training and new recruits about 19 days. There were no significant correlations found between job training satisfaction and the other demographic variables. Question two examined job type in relation to JTS. The distinction was made between technical service representatives and customer service representatives. For customer service staff, their JTS decreased to about 12 years of job tenure and was thereafter revitalised. The JTS of technical service staff fluctuated between lows (4th to 6th year), highs (between 7th and 9th years) and lows (at the 10th year) according to Schmidt (2009:306).

Apart from the other hypotheses dealing with age and gender, the Schmidt study is linked to the following hypothesis:

$H8_0$: There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

$H8_A$: There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

The third research question found that temporary employees were significantly more satisfied with the same amount of training than their permanent counterparts (Schmidt, 2009: 307). The researcher deduces that his results are inconclusive since, furthermore, temporary staff were only employed in their first year of job tenure and therefore would obviously be

more satisfied. Schmidt advises HR professionals to develop training programs allowing for job type and tenure rather than for demographics. Furthermore, he argues that organisations should be aware that since the training needs of older employees may differ from those of new recruits, training should build on their existing knowledge and experience (Schmidt, 2009: 310). Schmidt recommends, however, that researchers continue investigating the relationship between demographic variables and JTS, especially in other industries (Schmidt, 2009: 310). While the value of the study cannot be discounted, one limitation that must be acknowledged would be that respondents included mainly 20 to 35 year olds. In the current SCM study, SC personnel may be generally older. Another limitation would be the fact that only two job types were reviewed and this small number could be misleading and overly simplistic in the SCM research study.

Training programs and interventions are not always evaluated for any positive returns on the training money invested (Pineda, 2010: 673, Meyer, Opperman & Dyrbye, 2003: 8). Besides the need to learn and unlearn skills, training is meant to help achieve the business objectives of the organisation. Evaluation of training entails gathering information about the outcomes set under a strategic perspective (Pineda, 2010: 674). The Kirkpatrick model of training evaluation consisted of four levels (Pineda, 2010: 676, Meyer, *et al.,* 2003: 2):

i.   Reaction: measuring trainee enjoyment, value of the training and overall experience.
ii. Learning: testing the knowledge gained by the trainee
iii. Behaviour: evaluating whether trainees change their behaviour in practice after the training
iv. Results: investigating the overall impact on the organisation after the training

Of these four levels, reaction is tested most often, especially directly after training has been completed. Level two is evaluated with tests to see whether trainees understood important concepts. Level three looks at the practical application of what was presented during the training. Level four checks to

see if, for example, more sales occur after the sales training (Meyer, *et al.*, 2003: 3). Although the Kirkpatrick model has been criticised by many, most agree that a pre-training and post-training evaluation procedure would produce the most accurate answers to any levels 1 to 4 questions. Pineda (2010: 677-678) prefers to ask five questions when designing a training evaluation program. Basically the questions are the following (Pineda, 2010: 677-678):

i.   Who will be evaluated?
ii. What aspects of the training should be evaluated?
iii. Who will be doing the evaluation?
iv. Which part of the training will be evaluated? (Is it the part before training, during training, at the end of training or some time thereafter?)
v.   How will the measurement be made?

The Pineda model allows for training and its outputs to be evaluated in the context of the organisation. Pineda looked mainly at Spanish doctors' use of medicine in order to determine what the training return on investment (ROI) was for the health sector. The study contributes valuable insight since it ran over a period of eight months of training interventions for doctors. It showed improved professional use of medicines after doctors underwent the training (Pineda, 2010: 690).

In conclusion, this section on training briefly summarised the definition of training as being a systematic attempt to alter employee skills, knowledge and behaviour as discussed in the ROI study. Training follows a process with programs to be implemented. Training myths should be eradicated since training cannot fix all the problems an employee experiences at the workplace. The call has been made to continue research links between demographics and job training satisfaction. In order to understand the ROI focus, the methodology chapter will discuss how research must precede and follow training needs analyses. The third part of the ETD equation, dealing with development will be discussed in the following section.

2.5. DEVELOPMENT

Employee development is viewed as being wider in context than employee training (Erasmus, *et al.,* 2007: 3, Meyer & Mokoele, 2003: 14). While training has been customised to each individual in a personal context, development is seen as a series of interactions that includes coaching, mentoring and apprenticeships amongst others (D'Abate, Eddy & Tannenbaum, 2003: 360). Although employees attend many short–term training sessions, development is more focused on career advancement (D'Abate, *et al.*, 2003: 366). Mangan and Christopher concentrate on long-term development by juxtaposing the supply chains of the future with the type of managers required to run them. They contrasted managers of the future with managers they observed in 2005 and called for development programs to fill the gaps in competencies (Mangan & Christopher, 2005: 181). Management development is said to contain elements of both education and training according to Erasmus, *et al.,* (2007: 3).

On the other hand, some authors still characterise development as being short term in duration. Lawson describes it as a structured process to enhance the knowledge, skills and attitudes of the learners (Lawson, 2008: 233). This agrees with the view held by Barbazette who thinks an employee should have a development plan when a skills deficiency has been identified and a goal has been set (Barbazette, 2006: 161). The implication is that changes will be visible in the trainee at least by their next performance review. While some authors revert back to training interventions as part of employee development, the South African context includes a unit standard of ETD measurement as being inclusive of knowledge, skills and behavioural attitudes (Meyer, Opperman & Dyrbye, 2003: 68): Unit standards are desired outcomes of ETD and their assessment criteria allow all stakeholders to compare ETD programs (Meyer, *et al.,* 2003: 68). This means that, in this research study, development is referred to as being related to long-term skills development as opposed to short-term training interventions.

Dealing with skills development, for the purposes of the research project, is seen as a gradual process of growth. Skills development can take place at any time when opportunities are used in either the individual's lifecycle or the outer sphere (Garavan, 1997: 42). People do not have to be enrolled in a formal development program in order to learn something new. Research into social and observational learning found that people also learn by observing others and imitating their actions (Botha & Coetzee, 2007: 59, Erasmus, *et al.*, 2007: 108). Skills development is not confined to the classroom or coaching situation according to Garavan (1997:42). Skills development can differ from informal learning in terms of the focus of activities used in the process, the clarity of objectives being set, the time scale, values, content, evaluation methods and outcomes.

The Garavan study relates to the following hypothesis:

$H2_0$:   There is no significant difference in the format of training preferred by managers compared to employees.

$H2_A$:   There is a significant difference in the format of training preferred by managers compared to employees.

It is important to note that ETD of individuals will collectively add to their organisations' ETD practices. The scope of this research project will be unable to assess organisational ETD within the constrained time frame. To summarise, this section characterised development as being more long term than training. It briefly explained the SETA concept for the South African ETD context and explained the functions of the NQF. The main motivations for focusing on training, as opposed to education and/or development will be explained in the next section.

2.6. REASONS TO FOCUS ON TRAINING

The Department of Labour defines the entire labour force as consisting of all persons employed and unemployed. In South Africa the employed are between the ages of 15 and 64 years and those who worked for at least ONE

hour during the reference week of the survey are included in the data that follows (StatsSa, 2009: xvi). According to the census taken, the September, 2005 approximations of employed HR are listed in Table 2.3.

Table 2.3.   Age grouping of the South African employed citizens

Age grouping (years)	Approximate number	Approximate Total
Less than 24	1.3 million	
25-34	4.3 million	
35-44	3.5 million	
45-54	2.5 million	
55-64	1.0 million	
Total		**12.6 million employed**

Source: Adapted from the Labour Force Survey (2009: 17).

The industry sectors where the human resources are employed, according to Table 2.3, include mining, manufacturing, utilities, construction, trade, transport, finance, community and social services. Another survey looked at the types of educational qualifications reported by the 12.6 million employed HR reflected in Table 2.3. Data from the Quarter from July to September, 2009, are summarised in Table 2.4. Note that the total of employed workers in Table 2.4 does not correspond to the total listed in Table 2.3.

Table 2.4.   Highest level of education of the employed in South Africa

Highest education level attained	Number of employed workers (Jul-Sep 2009)
No schooling	455 000
Less than primary school completed	1 162 000
Primary completed (7 years of school)	646 000
Secondary not completed (including leaving school with junior certification)	4 178 000
Secondary completed (12 years)	3 820 000
Tertiary education completed	2 454 000
Other qualifications	168 000
Total	**12 885 000**

Source: Adapted from Quarterly Labour Force Survey (2009: 17)

From data in Table 2.4, the surprising deduction that can be made is that only 19% (that is 2 454 000 people) of the employed labour force currently has tertiary education. This leaves an estimated 81% who have either no notable

education or up to only secondary education (Grade 12) completed (Labour Quarterly, 2009: 17). The implications are that all stakeholders have future training initiatives to offer and complete amongst the 10 million HR that work daily in this economy. The question that remains is to ascertain what training exactly is needed where?

Of course, the other side of the labour force coin is the unemployed. The South African government has made a commitment to halve unemployment by the year 2014, when the population is estimated to be about 48,7 million (Erasmus, *et al.*, 2007:48). These policies and strategies entail the provision of training and the re-skilling of workers in order to make them employable in the current economic climate. A compelling argument for talent management is as follows: pro-actively manage the talents/skills or qualifications of the employed and source those with potential to be employed.

The heart of the matter in any country should be to anticipate the need for HR and set out a plan to meet the need (Cappelli, 2008:74). Talent management programs in the USA have been mainly dysfunctional, oscillating between surpluses and shortfalls of talent. The old way(s) of meeting HR demand was/were to do no planning and to react to the demand by using outside HR sourcing companies to find talent. Problems arose when surplus talent had been eroded! The other approach to meeting talent demand used legacy systems from the 1950s that forecast and planned for talent during predictable business conditions. The current practice in a talent-on-demand framework is that business organisations borrow from SCM, since they then have to allow for the uncertain market environments (Cappelli, 2008:74).

The risks associated with HR in SCM are that well-trained talent can become expensive inventory when sitting on the bench. This can occur even when existing employees fail to use their newly acquired skills after having been sent on training programs. The talented HR skills base is also posing the risk of walking out the door and being lost to the organisation (Cappelli, 2008:78). Businesses and other organisations are therefore faced with the dilemma of
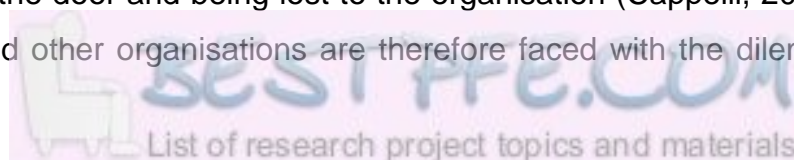
making (i.e. training) their HR talent or buying (hiring) already trained HR from outside their own organisations.

Cappelli, (2008: 81) describes the four principles that he thinks organisations should follow when making a make-or-buy HR talent decision. These principles are first briefly summarised in Table 2.5 and discussed in greater detail thereafter.

Table 2.5.   The Cappelli principles for deciding whether to make or buy HR talent

Principle number	HR talent "make-or-buy" decision
Principle 1:	Firms must manage risk. The investment in training does not equal entitlement:- organisations should rather train too little HR than to have trained staff that can be poached by competitors.
Principle2	Adapt to the uncertainty in demand. Firms rather train for 18 months on general management, and are not keen on 3-year-long programs: They prefer allowing employees to return to their normal work functions to learn specialist skills.
Principle 3:	Improve the ROI in developing employees. Firms can ask HR to pay for some of their training/ do stretch assignments on own time/ or maintain friendship to the point of letting HR return after leaving.
Principle 4:	Preserve the investment by balancing employee-employer interests. Firms should let HR share in advancement decisions or else watch them leave for better opportunities.

Source: Adapted from Cappelli (2008: 78)

Findings from the Cappelli study include the following: When deciding whether to make or buy, that is, to train HR talent or not, one has to consider the following issues based on Cappelli Principle 1:

- The longer the HR talent is needed in the entity, the more inclined organisations will be to invest in training the talent.

- When there is uncertainty about the long-term forecast, trained HR will simply be poached.

- Functional areas present room for training without spending too much money on them, that is, on-the-job learning is beneficial.

- HR talent will not be hired from outside if the corporate culture is to be maintained at a status quo.

- Undershooting the HR talent forecast is not difficult to remedy when dealing with low-level skills but may cost a premium when HR agencies are used for higher-level skills. It worsens when HR agencies are required to absorb the associated risk such as misfit employees (Capelli, 2008: 77-79)

When deciding whether to train HR talent or not, one has to consider the following issues in Cappelli Principle 2:

- The time horizon on sourcing talent can be shortened by rotating new hires every three months instead of taking in only one batch per year.

- Training programs can also be subdivided into discrete parts dealing with general management, interpersonal skills and some functional knowledge and not take as long

- Diversify. Instead of relying on one source/supply of skills, rather train employees with generic interchangeable skills, enabling one employee to do a range of jobs. This will help HR management to specialise into roles as and when required to close any gaps in knowledge required (Cappelli, 2008: 79-80).

When deciding whether to train HR talent or not, one has to consider the following issues based on Cappelli Principle 3:

- Ask employees to sign contracts to continue work after they have been given expensive training. In the USA, it is common for about 20% of

employers to expect repayment of the investment if employees decide to leave before that agreed time (Cappelli, 2008: 80).

When deciding whether to train HR talent or not, one has to consider the following issues in Cappelli Principle 4 (Cappelli, 2008: 81):

▪ Firms need to balance employer-employee interests

▪ In the past, it would be considered a career-limiting move to disagree when managers and executives have identified certain "opportunities" that match the skills of the employee. Matching individuals to jobs was common practice – which would have encouraged employees to leave. Current practice suggests that internal job boards be used, in order to retain the HR skills inside the organisation, which allows employees more freedom in managing their careers (Capelli, 2008: 81).

▪ In the USA 50% of new employers do not require the permission of the existing employer to allow employees to move to new positions/posts.

▪ Conflict exists where employees want promotional opportunities, employers demand affordable HR skills in the form they require and national interest generally lies in higher-level skilled employees (Capelli, 2008: 81).

Cappelli (2008: 81) concludes the study with a call to move away from the old engineering type models used for HR talent management. The call is to use market-related, operations-based tools that can be better applied to the challenge of uncertainty. All countries, including South Africa need to proactively manage HR talent make-or-buy decisions from a strategic perspective. In doing this, it is however important to question how much training had previously taken place, who provided the training and who received it; similar to the way the USA dealt with their critical skills gaps that existed many years ago (Frazis, Gittleman & Joyce, 2000: 443).

2.7. CONCLUSION

This chapter briefly distinguished between all three components of ETD and motivated why training is important to alleviate labour force shortcomings.

The South African historical context in education was also briefly discussed together with the changes in legislation that took place after the 1994 elections. The SAQA is also highlighted in this chapter as being the standard setter and the custodian of quality of training. The NQF is also mentioned as being the mechanism to compare the HR educational qualifications and to know that training is globally recognised.

It is becoming more imperative for business concerns in South Africa to build a larger skills reservoir. HR training and skills development should ideally be aligned to stimulus plans for specific industries and sectors of the economy (Mayer & Altman, 2005: 52). The policies are in place for ETD practice to take place in South Africa. Chapter three contains research findings from other countries on TNA that will demonstrate that much work still needs to be done in ETD. Chapter three will also look at specific barriers to HR training and identify variables that will be measured in the empirical TNA research study.

CHAPTER THREE   **TRAINING NEEDS ANALYSIS**

3.1. INTRODUCTION

3.2. TRAINING NEEDS ANALYSIS

3.3. MODELS OF TRAINING NEEDS ANALYSIS

3.4. REASONS TO FOCUS ON TRAINING NEEDS ANALYSIS

3.5. CONCLUSION

3.1. INTRODUCTION

Since the importance of ETD was discussed in the preceding chapter, it must be emphasised that successful training interventions are most probably initiated by conducting training needs analysis (TNA). This chapter defines the what, who, why and how of TNA and briefly states how it differs from training needs assessment. It attempts to demonstrate the value of conducting TNA in organisations. This chapter further supports the inclusion of some research objectives in the South African supply chain management (SCM) context.

The use of training models provides a clear indication of where employees require training. It also helps analysts provide focused answers and lends a framework to the TNA (O'Brien & Hall, 2004: 935, HRD Department of the Institute of Personnel Management, 1994:1). Different training models will be briefly contrasted in order to select suitable tools for the SCM TNA study.

Although the research study problem statement signals the current mismatch of employee SCM skills demanded and supplied, 2004 researchers still noted the non-existence of a well-defined formal method of implementing a TNA (O'Brien & Hall, 2004: 936). Common TNA methods involve ratings done by managers to which employees either agree or disagree (O'Brien & Hall, 2004:936). Although training is not the cure for all ailments in HR, it helps to eliminate obvious skills requirements while other mechanisms address remaining HR needs.

3.2. TRAINING NEEDS ANALYSIS

In the training context, a need is defined as a gap between a current situation and a future situation where a discrepancy exists between " what is" (which is the present state) and "what should be", the desired state (Witkin & Altschuld, 1995: 4, Swist, 2001: 1). A need is not to be confused with a wish (Witkin & Altschuld, 1995: 8) since most wishes remain unfulfilled. If training needs could not be distinguished from wishes, the human unlimited wish-list effect

could possibly be a glaringly obvious explanation for the unfilled gaps in training needs. As such, it is as important for managers to participate in TNA as it is for their employees.   Managers provide both qualitative and quantitative feedback on TNA. The TNA feedback can be used as inputs by human resource managers to facilitate future training program content and operational level changes (Swist, 2001: 3).

A training need should not be confused with a want, which is something that an employee would like to have irrespective of the fact that it will not contribute to any long term learning or performance goals (Swist, 2001: 1). Consequently addressing training needs is seen as contributing to business long-term goals (Gupta, Sleezer & Russ-Eft, 2007:30). Berwick preceded the long term perspective of Gupta, *et al.* in 1989, by positing that the perception of a need, comes from what one believes to be educationally worthwhile. Berwick (in Tajino, James & Kijima, 2004: 8) emphasized that needs are not simply out there, waiting to be measured or counted, but should evolve towards meeting the learning or performance goals of the individual or the organisation (Tajino, *et al.,* 2004: 8).

Another approach to defining TNA, considers it as the first step in the training cycle and the first stage of needs assessment. The creation of a training plan is what makes a needs analysis turn into a needs *assessment* in the training context. The training cycle stages are depicted in Figure 3.1.

Figure 3.1. The five stages of the training cycle
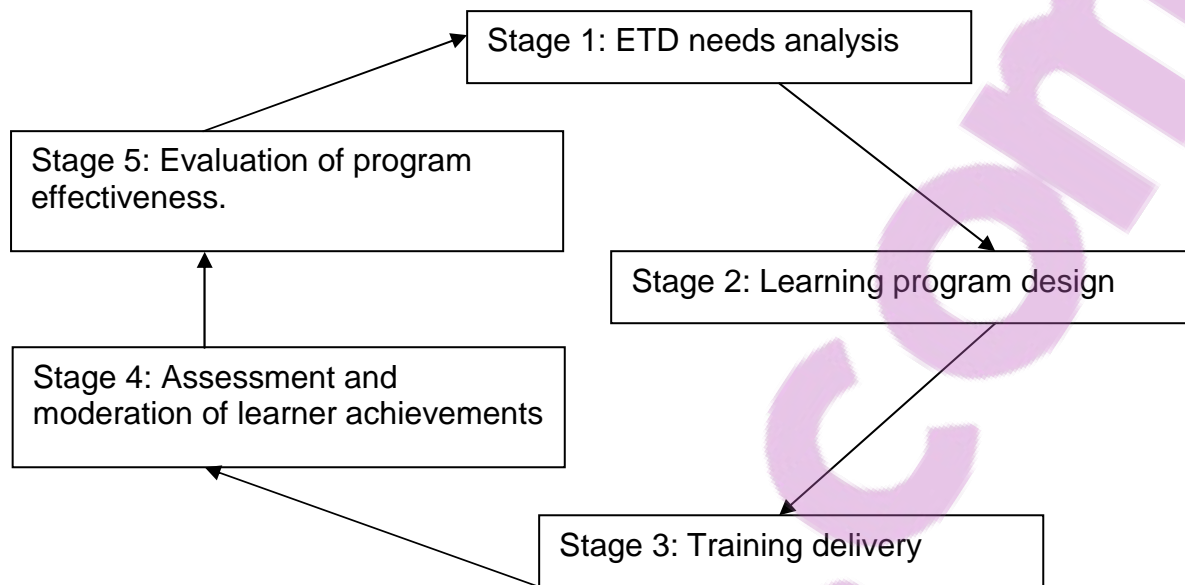
Source: Adapted from Truman in Coetzee (ed), (2007:214)

The training cycle depicted in Figure 3.1. is clarified through each stage:

- **Stage 1:** During the ETD needs analysis
- **Stage 2:** When busy with learning program design
- **Stage 3:** Training delivery is where actual programs are implemented
- **Stage 4:** Any form of training is usually accompanied by the assessment and moderation of learner achievements.
- **Stage 5:** For the training cycle to be complete, there should be an evaluation of the program effectiveness.

If individuals are to have tailor-made training programs it is vital to survey the worker demographics, job classification and prior training (Harrison, Davis, MacDonald, Alexander, Cline, Alexander, Rothney, Rybka & Stevens, 2005: 29). The Harrison *et al.,* (2005: 28) study conducted a TNA amongst public health employees in North Carolina, United States of America, that demonstrated the importance of TNA in designing appropriate training

programs. About 150 public health-care job classifications were found, within one state in the USA.

Core competency was surveyed in the first phase and a link between competence, job classifications and actual employees was part of phase two of the study. Harrison *et al.,* (2005: 30) included barriers-and-facilitating factors in their survey of health employees. Barriers to participating in the TNA survey, included the time taken to complete the questionnaires (30-40 minutes) together with limited computer literacy and access since the TNA questionnaire was accessed online. Another barrier to TNA is the accompanying fear that employees who receive training will want to change their places of work soon thereafter (Harrison *et al.,* 2005: 32). Facilitative factors were the incentives that participating organisations would receive grant funding towards training in bio-terrorism responses. The fear of employees leaving the company was addressed in chapter two in the Cappelli Principle 3. It features a discussion of how, in the USA, it is common for about 20% of employers to expect repayment of the investment if employees decide to leave before their agreed time (Cappeli, 2008: 80).

This is a quick reminder of the hypothesis that is linked to the Harrison *et al.,* study:

$H9_0$: Employees are not likely to request more training when employers insist on a repayment contract

$H9_A$: Employees are likely to request more training when employers insist on a repayment contract

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Harrison *et al.,* (2005: 33) concluded that it was essential to pursue both individual and organisational training plans. They concluded that TNA results should be directly linked to applicable training programs.

3.2.1. The need for training needs analyses

The TNA survey could distinguish four levels of training within organisations. These levels (1-4) are as follows:

1. General training for all employees such as health and safety, for example are at level one.

2. Hierarchical level training is at level two. This level gives employees access to training programs if they are on the required rank/position within the organisation.

3. Level three, means that specific job functions automatically qualify for certain types of training. For example, accountants should receive tax training.

4. At level four, role specific training can delve deeper into job functions, indicating, for example, that HR managers should know how to manage employee leave requests.

O'Brien and Hall (2004: 937) agree that the four-level structure of a TNA can only be successful if general questions to be answered by employee respondents can be targeted and successfully answered at each level (O'Brien & Hall, 2004: 937). According to O'Brien and Hall (2004: 937), TNA is the first step towards structured design of training programs. Their ultimate goal was to design electronic learning training programs to prevent small and medium enterprises from lagging behind in training their employees (O'Brien & Hall, 2004: 937). They are adamant that TNA is a vital first step towards designing successful e-learning content and training programs (Swist, 2001: 1, O'Brien & Hall, 2004: 937, Harrison, *et al.,* 2005: 33). The nature of such a comprehensive approach to TNA would probably require a longitudinal research approach, which is beyond the scope of this research survey.

All organisations have strategic and operational business needs which must be linked to training programs (O'Brien & Hall, 2004: 938). Within these two levels there are also individual performance needs and individual learning needs (Gupta, *et al.*, 2007: 31). The following factors listed by Brown (2002: 571) were seen to signal possible training or development needs of employees:

- Development of employee or management skills to fill a current need such as reduction in workforce, employee reassignments and promotions

- Employee relations or problematic organisational problems

- The changing skill required when new technologies are being introduced, when equipment is modernised or business regulations change
- Career development at employee request or career enhancement plans

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The hypotheses that are applicable to the theory above include:

$H3_0$:   There is no significant difference in reasons motivating employees to attend training

$H3_A$:   There is a significant difference in reasons motivating employees to attend training

$H7_0$:   There is no difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

$H7_A$:   There is a difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

---

It is worth noting that the factors listed by Brown are possible signals. They should not therefore, of themselves, be assumed to be training needs. Brown stresses the need to have ongoing needs analyses processes in place in a business environment (Brown, 2002: 569). Seven years prior to Brown, MacDuffie and Kochan were testing the assumption that USA automotive manufacturers were investing less in HR than were the rest of the world (MacDuffie & Kochan, 1995: 147). The answer was affirmative: that the USA did spend less money on their HR training. MacDuffie and Kochan suggested four alternative reasons why USA firms under-invested in training their employees, which included:

- The USA needed to focus on quality since they were not a low-wage economy, nor could they rely on well-educated Americans from a faulty education system (MacDuffie & Kochan, 1995: 148). With this reasoning they were trying to clarify the point that highly industrialised countries should actually spend more than developing countries on employees' further education and training.

- MacDuffie and Kochan, stated that cultural differences ensure that other countries spend more; for example, when Japan offers workers lifetime employment, it also means they invest more in training over time (MacDuffie & Kochan, 1995: 148).

- Their results on whether new technology requires more knowledgeable workers or actually displaces workers were inconclusive. This led to the MacDuffie and Kochan deciding that training should be part of an organisation's strategic concerns instead (MacDuffie & Kochan, 1995: 148).

- The fourth justification for not doing so much training is that overall business strategy should dictate training requirements and not external macro-economic challenges (MacDuffie & Kochan, 1995: 149). .

MacDuffie and Kochan discovered that newly hired staff received more training per annum than the workers already experienced in production techniques. One shortcoming that they acknowledge is that "more training" did not inform them about the topics and methods used for training (MacDuffie & Kochan, 1995: 155). The European and Japanese firms trained their staff more, according to the MacDuffie and Kochan study, due to their production strategies being flexible rather than espousing mass production (MacDuffie & Kochan, 1995: 164). The parent firm's strategy, rather than a decentralised production facility's scale, the mix of products or complexity of its parts is what determines the HR training strategy (MacDuffie & Kochan, 1995: 164).

The hypothesis that is deduced from the question of MacDuffie and Kochan's experience versus youth concern is:

$H8_0$:   There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

$H8_A$:   There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

---

While the MacDuffie and Kochan empirical results did not lead them to the exact conclusions, they did conclude some pointers that would also apply to the South African research study context. MacDuffie and Kochan submitted that training instituted by national policy would focus more on technical skills. The reasons behind this statement, stem from the mobility of technical skills to transfer in-between jobs and industries (MacDuffie & Kochan, 1995: 166).

The need to verify or certify the level of skills also puts pressure on national bodies to maintain certain standards. A mix of general skills, such as problem solving is also important, since reading, mathematics and reasoning are all required in today's business organisations. Already in 1995, the USA companies were concerned about retiring employees and the possibility of skills shortages, which now constitute the reality of the year 2012 (MacDuffie & Kochan, 1995: 166).

Training has been lacking since industries changed around World War II, according to Lee and Lancaster (1971: 4). After 1945, manufacturing started using continuous processes that required technical maintenance of machines and equipment. Blue-collar maintenance staff grew in numbers without the required growth in training programs to accompany the shift from physical strength maintenance to knowledge/analytical strength maintenance (Lee & Lancaster, 1971: 46-48). The resultant gap in training was not going to be remedied overnight, nor was it going to be cheap to implement (Lee & Lancaster, 1971: 48). Lee and Lancaster raised the call for more investment in training, continuous training and empirical research to be conducted on maintenance-work relationships (Lee & Lancaster, 1971: 48).

Lee and Lancaster (1971: 49) predicted that a skilled master craftsman would no longer be the norm and that workers' opportunities would lie in knowing more than their own supervisors about technological developments and processes. Contrary to how employee working life and industries ran before the war, Lee and Lancaster also predicted that even master craftsmen would need continuous learning because employees could change their jobs at least

three times in their lifetimes (Lee & Lancaster, 1971: 49, Harrison *et al.,* 2005: 33).

3.2.2. Responsibility to conduct TNA

Training itself has been criticised for the fact that employees hardly know how to implement the training they have received (Vermeulen, 2002: 366). Transfer of training is seen as successful when it can overcome time, space and contextual differentials (Vermeulen, 2002: 366). The author suggested that role–play is an essential technique to help employees transfer their newly acquired knowledge on their return to the office. Role-play, which makes it necessary to revisit the roles of the HR manager, is probably not the number-one priority of HR professionals. One view of a starting point for HR is to use Job Analysis as a human resource management tool, for understanding first where TNA fits into the overall picture.

Figure 3.2. Job Analysis as a human resource management tool
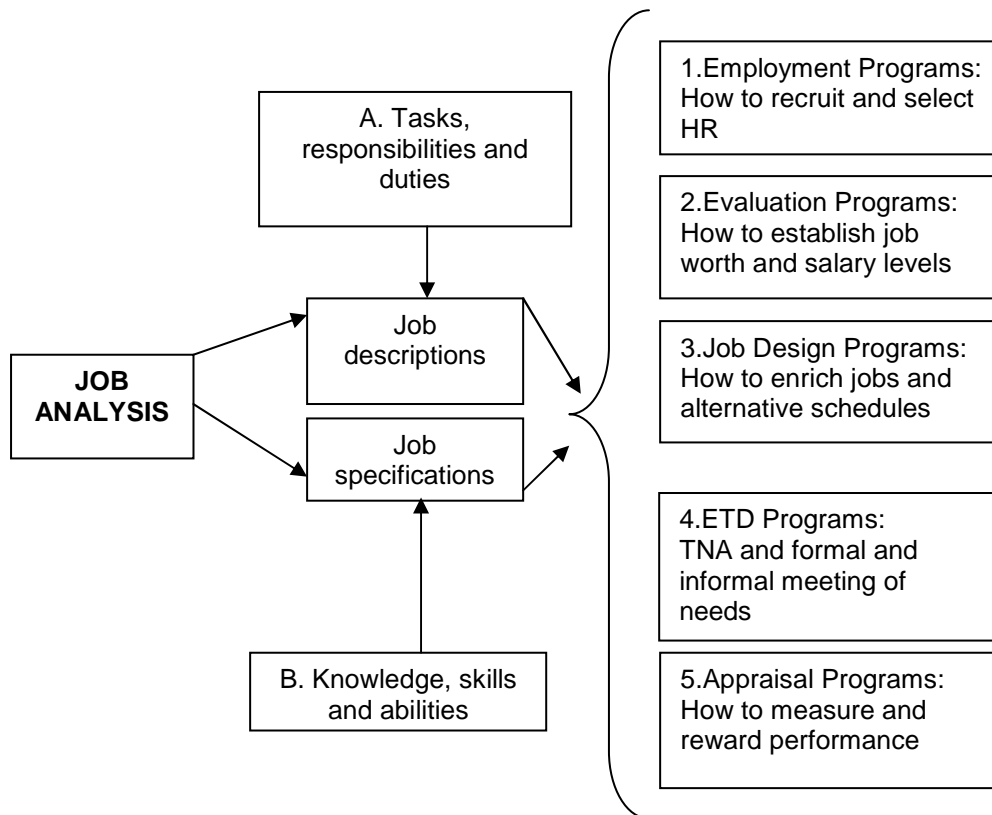
Source: Adapted from Grobler, Wärnich, Carrell, Elbert and Hatfield (2009: 156).

In terms of Figure 3.2. a job analysis consists of looking at a job description and a job specification. This is part of the normal HR management functions. The scope of this research is limited to section "B" which refers to "employee knowledge, skills and abilities". The research also limits the scope to the subsection numbered "4" in Figure 3.2. Subsection number four refers to ETD programs, TNA and how these may build on employee knowledge, skills and abilities.

TNA can be done via different techniques including holistic strategic plan analysis, analysis of the HR plan, interviews, questionnaires, observations and the routine performance review process (HRD Department of the Institute of Personnel Management, 1994: 12). In industrial practice, however, it is

possible for HR training plans to have been drawn up independently of what the real training needs are.

In contrast to TNA that forms part of the training cycle, Gupta *et al.* see training needs assessment (sometimes also abbreviated as TNA) as a diagnostic process. Training needs assessment includes data collection, collaboration and negotiation to identify and understand gaps in learning, performance and future training actions. Needs assessment differs from TNA in that it uses more than one type of analysis and a three-phase process to collect, analyse information and create a training plan (Barbazette, 2006:5, Witkin & Altschuld, 1995: 14). According to Barbazette, the needs analysis can take many forms, which include the following:

- Feasibility analysis
- Needs versus wants survey
- Goal analysis
- Task analysis
- Target population analysis
- Contextual analysis (Barbazette, 2006: 8)

Barbazette sees the use of TNA as finding gaps in an individual employee's performance that may be caused by either personal, information-related or environmentally related barriers to performance (Barbazette, 2006: 24). These barriers have been more closely investigated by Barbazette by using 5-point rating scales within organisations, similar to what will be used for this research project (Barbazette, 2006: 47). Note that Barbazette is quick to add that non-training solutions may also be applied to addressing gaps in training (Barbazette, 2006: 35). In any organisation, it is possible that employees may be referring to the same training need but everyone calls it by a different name (Barbazette, 2006: 75). In such instances, it becomes the responsibility of HR, skills development facilitators and managers to discuss TNA survey findings and reach consensus on the training programs to be implemented. Barbazette emphasises the point that success in TNA is improved when HR can link training needs to business needs in order to convince higher level management to support training initiatives. (Barbazette, 2006: 110).

The mere collection of training need information should not be viewed independently from other company information on employees. Homer (2001: 59) suggested that the lack of information about skills that employees already have, can lead to delays in filling vacant positions within organisations. He also suggests that a competency management system would allow managers to search their current employees' skills profiles and save the recruitment costs (Homer, 2001: 60). Referring to the employee side, Homer comments on a Whitman-Hart Institute for Strategic Education (WHISE) career management system that helps employees identify their own skills gaps and shows them how to close those gaps (Homer, 2001: 60). The notion of having a skills library is probably not equally common in all organisations otherwise they would not have complained about shortfalls and skills gaps. The author stresses the use of skills management systems to the point of identifying so-called soft skills (for example presentation skills) and attributing these skills to individual employees to benefit the business in the long run (Homer, 2001: 62).

A reminder that the theory of Homer refers to the types of skills (such as soft skills) is the following:

$H1_0$:   There is no significant difference in the training received by managers and employees in the preceding 12   months

$H1_A$:   There is a significant difference in the training received by managers and employees in the preceding 12   months

---

The TNA to be investigated will henceforth pertain only to training needs analysis and not training needs assessments. From the collaborative research of scholars three often-cited models that have been applied to conducting TNA are explained in the following section.

3.3.   MODELS OF TRAINING NEEDS ANALYSIS

A realistic TNA is reliant on insider information about the real situation to figure out the gaps that need to be filled (Gupta, *et al.*, 2007: 1). Thus the

research methodology included two phases and going onsite to use current business employees as the respondents. It must be duly noted that Sharan Merriam, an expert in adult education wisely stated that no single theory, model or set of principles will ever be able to explain the complexity of adult learning (Zemke, 2002: 87). Therefore, in this section, a few TNA models are described, to illustrate the reasons for selecting a hybrid model for this TNA study.

3.3.1. Boydell's Systems Model of TNA

In 1977 Boydell identified three levels where training needs can be identified (HRD Department of the Institute of Personnel Management, 1994: 7). These are the organisational level, the occupational level and the Individual level. At the organisational level, corporate strategy and HR plans can be effective to determine training needs. However these training needs must always be interpreted according to the interdependencies between training and the macro-environment.

The generally accepted view that an organisation is made up of systems (or main functions) with inputs and outputs is depicted in Figure 3.3. The occupational level deals with specific functions taking place in an organisation. These functions of an organisation, for example the Financial System, form their own unique systems. Systems that are interdependent include Financial, Social, Information and Technological. Each of these systems has human aspects (perceptions, skills, culture) and some aspects of technology (equipment, methods, processes). The individual level is found as a subsystem within a particular organisational function or system. Individual level information can only be obtained by conducting performance appraisals.

Figure 3.3. Boydell's system model of TNA
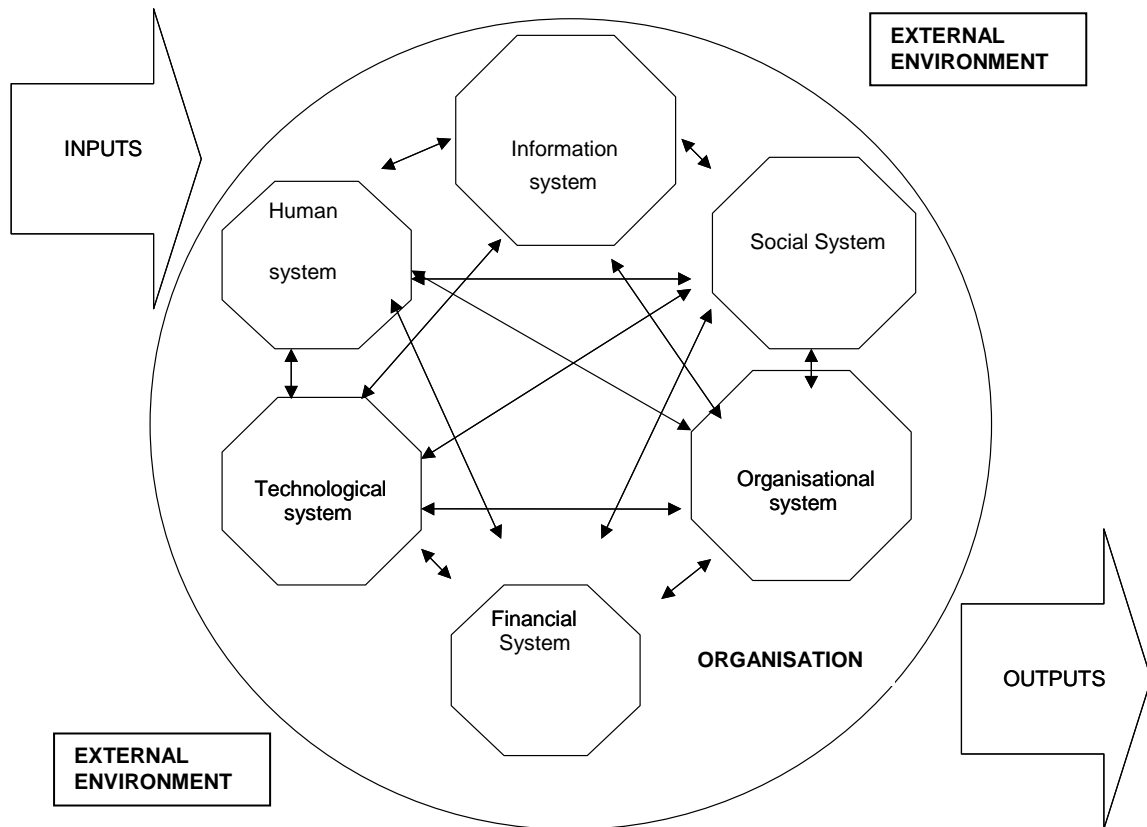
Source: Adapted from HRD Department of the Institute of Personnel Management (1994: 2)

Due to the complexity of the Boydell Model illustrated in Figure 3.3, Boydell's TNA must be applied at organisational level, functional level and individual level. All systems interact with each other and with the external environment. Individual and occupational levels of TNA will not be able to be analysed without breaking down jobs into critical skills, knowledge, standards and attitudes (HRD Department of the Institute of Personnel Management, 1994: 8). Since too many interdependencies of variables already exist in the Boydell Model, it will not be used in this research project.

3.3.2. Mager and Pipe's Human Performance Model of TNA

The second TNA model to be discussed is the Mager and Pipe model. The Mager and Pipe Human Performance Model is usually illustrated in a

flowchart diagram (Zemke & Kramlinger, 1982: 18-21). The model suggests that a manager can easily identify training needs by asking twelve questions. Table 3.2. lists the 12 key questions and their respective subsets of questions that will allow any manager to determine the training needs of his or her employees.

Table 3.1. Questions from Mager and Pipe's Human Performance Model

Main Question	Respective sub-set of questions
1. What is the performance discrepancy?	▪ What is the difference between what is expected of the employee and what is being delivered? ▪ What evidence supports the answer above? ▪ How reliable is that evidence?
2. Is the difference important?	▪ Why is the difference important? ▪ What will happen if we do nothing at this point? ▪ Is it worthwhile to actually do something?
3. Is the employee lacking a specific skill?	▪ Could the employee do the job if it really mattered to him/her? ▪ Are the present skills levels at least meeting minimum standards?
If it is definately a skill or knowledge deficiency, the following questions are asked:	
4. Was the employee able to perform on the job in the past?	▪ Have the employees forgotten how to do it? ▪ Do they know it is still expected of them?
5. Is the necessary skill used often?	▪ How often is it being used? ▪ Does the employee receive enough feedback on how well he/she is using that skill?
6. How simple is the solution to fix the problem?	▪ Should the employee be trained? ▪ Should the job be adapted? ▪ Can the employee be rotated elsewhere?
7. Does the employee have what it takes to do the job?	▪ Is there physical/mental potential inherent in the employee? ▪ Could the employee possibly be overqualified for the job at hand?
If it is definately NOT a skill or knowledge deficiency, the following questions are asked	
8. If it is not a skill/ knowledge deficiency, is the desired performance being punished?	▪ Does doing the desired performance lead to punishment for the employee? (which means it acts as a disincentive) ▪ Is there some pressure NOT to perform?
9. Is non-performance being rewarded?	▪ What does the employee get for not performing?

10. Does doing the job correctly really matter to the employee?	▪ What kind of reward/self-pride/status is associated with doing the job? ▪ What is associated with NOT doing the job?
11. Are there obstacles that hinder performing on the job?	▪ Does the employee know what is expected? ▪ Does he or she know when it is expected? ▪ Are there many other competing demands for the employee's time? ▪ Does tradition/policy/ego create obstacles? ▪ Is the job physically a "mess"?
12. What are the limitations to possible solutions?	▪ Which solutions may not be accepted by the organisation? ▪ Are the possible solutions beyond the financial and time resources of the organisation?

Source: Adapted from: Zemke & Kramlinger, (1982: 18-21), HRD Department of the Institute of Personnel Management (1994: 3-4).

An important constraint in the use of the Mager and Pipe Model, requires the line manager of an employee to take responsibility for the training when the needs are identified. Since respondent managers cannot be held accountable to conduct training after the research findings are disclosed, this responsibility requirement therefore eliminates the use of this model as a TNA tool for this research study. While the Mager and Pipe Model has been adapted by many trainer analysts since it was first published, the important aspect to keep in mind is that the model should be effective in asking specific questions that help with TNA.

3.3.3. The Zemke and Kramlinger Model of TNA

The Zemke and Kramlinger Model that follows claims to have its derivation from the Mager and Pipe Model (Zemke & Kramlinger, 1982: 22). Figure 3.4. depicts how Zemke and Kramlinger have summarised and incorporated the 12 questions from Mager and Pipe into their own model.

Figure 3.4. The Zemke and Kramlinger Model of TNA

Organisational:

- History
- Strategy
- Mission
- Goals
- Tactics
- Plans

Employee:
with (1.) skills, knowledge and
abilities has training needs:

He/she is influenced by:
(2). Objectives
(3). Expectations
(4). Rewards versus Punishment
(5). Regular feedback
(6). Management Support
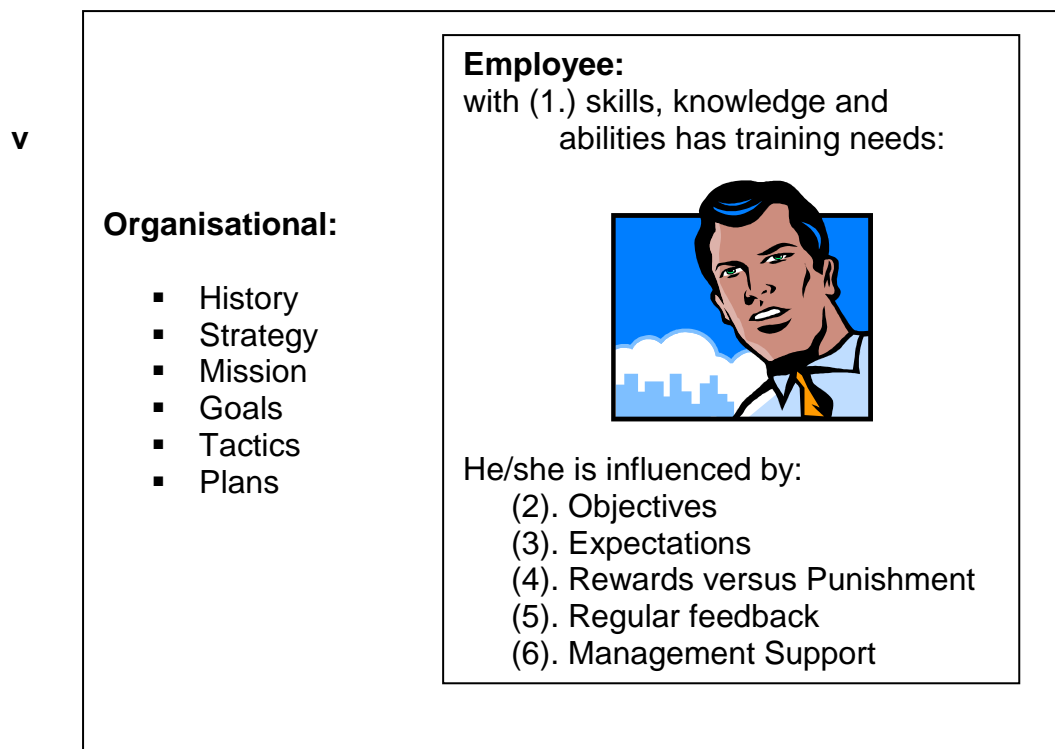
Source: Adapted from Zemke and Kramlinger (1982: 22)

Zemke and Kramlinger strongly believe in the six categories of variables that could help an HR manager or trainer to conduct a successful TNA (shown on the right hand side of Figure 3.4). The authors caution that they would seldom look for all six categories of variables in the same study. Zemke and Kramlinger recommend starting as high up in the organisation as possible and working one's way down in order to find out how problems are perceived at the organisational level, the operational level and the individual level (1982: 9). Thus it is important to review the literature to reveal studies completed since then, before adapting the TNA to an SCM environment.

Zemke (2002: 86) later criticised himself by stating that "training is about creating expertise, not only about pouring knowledge into people". He further stated that adult learners require training objectives, content, activities and assessment opportunities to be aligned with each other, before they will really learn something from training programs (Thiagarajan in Zemke, 2002: 89).

The fourth model of TNA discussed in this chapter is attributed to Fairbairns. In her research study Fairbairns (1991: 45) expands on the work of the preceding TNA models. In her three-circle model of TNA, Fairbairns argues that the two "good" traditional questions that are asked in a TNA are missing a third question about the "cultural dimension" (Fairbains, 1991: 45). The usual and traditional questions that are being asked are:

(a)   What skills/ knowledge/ attributes are important in your job? This is testing perceptions about relevance.

(b)   In which of these are you in need of training? This is testing for the respondents' learning priorities and their readiness for it.

According to Figure 3.3, the Fairbairns' recommendation is that a third question be asked, namely: What skills/ knowledge/ attitudes are likely to be recognised or rewarded after completion of training programs within your current organisation? The recommendation is to stop doing TNA if it is intended only to decide which training and development programs to run. Instead the tactical overlap of the three questions should be found. The Fairbairns' three-question tactical overlap is represented by ovals in Figure 3.5. The goal of Fairbairns is to analyse the kind of reception (hostile/receptive) any learning intervention is likely to receive.

Figure 3.5.   The three ovals where the three TNA questions must overlap

Legend:

1 = Important and in need of training but not likely to be rewarded

2 = Important and likely to be rewarded but not in need of training

3= The sweet spot. This is exactly where the trainee would like to be when in TNA.

4 = In need of training and likely to be rewarded, but not important in my job.
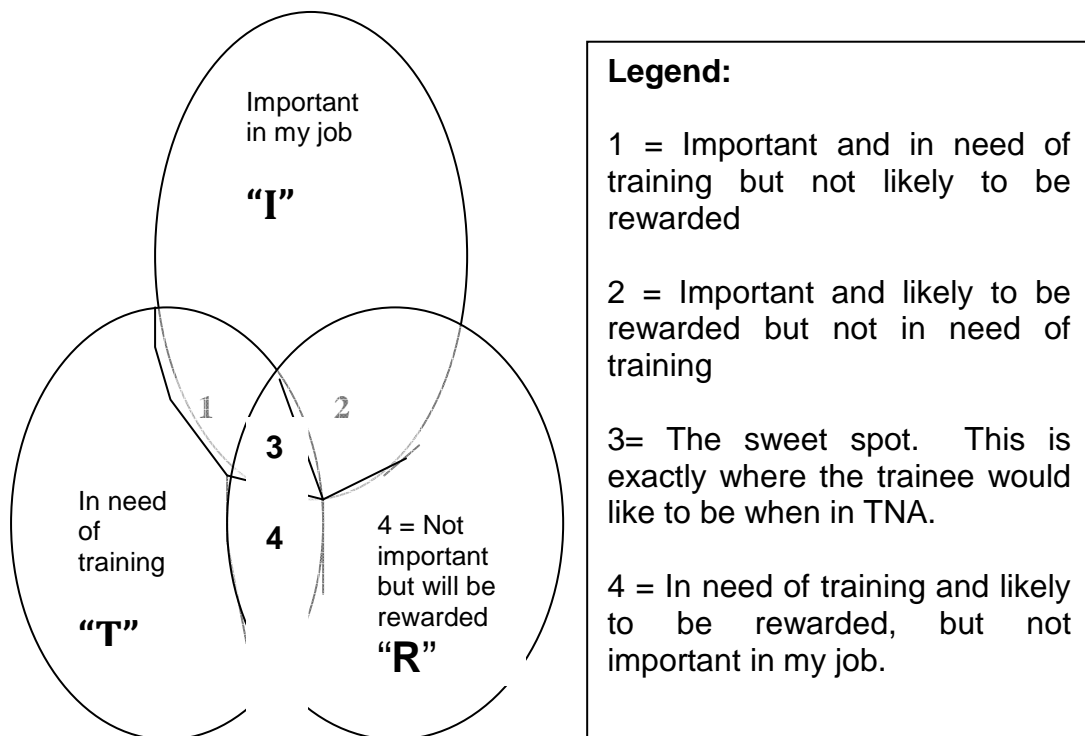
Source: Adapted from Fairbairns (1991: 44)

Fairbairns advises training analysts and researchers to find the overlap area between the following:

I = Importance of the training (to the industry)

T= Individual training needs

R= Likelihood of recognition or reward for undergoing the training (can be intrinsic or extrinsic) (Fairbairns, 1991: 45)

In Figure 3.5. there are overlapping areas in the parts labelled 1,2,3 and 4. The all-inclusive overlap is at number 3, where the employee will know that the training is important, needed and likely to be rewarded. It is therefore advisable to adapt a TNA for the SCM environment with the links between individual training, industry needs and rewards attached to training.

The question remains as to how one is supposed to conduct a TNA. According to Sally Sparhawk, the High Impact model is an effective tool for measuring TNA (Sparhawk, 1995: 102). A fifth model of TNA is that of Sally Sparhawk called the High IMPACT model. The six phase process focuses on TNA as a methodological start for a subsequent training process (Sparhawk, 1994: 13). Sparhawk says that the information captured should be sub-divided by groups and then measured in terms of the skills, knowledge, attitudes and other factors that exist and/or are desired by the respondents. This will allow the training practitioner to quantify and qualify the suspected training needs identified. This means that questions must be phrased for categorisation later (Sparhawk, 1995: 102). The High Impact Training model has six phases:

> I = Identify training needs,
>
> M = Map the approach,
>
> P = Produce learning tools
>
> A = Apply training techniques
>
> C = Calculate measurable results
>
> T = Track ongoing follow-through

Step "I" has six underlying steps: (1995: 1). This has some similarities to the general research process: (1) assess the current situation (2) envision future goals (3) gather information (4) sort the information (5) share results (6) decide on way forward. Noteworthy again is that, because of time and funding constraints, this research project must be limited to phase one of Sparhawk's High Impact TNA model.

3.4. REASONS TO FOCUS ON TRAINING NEEDS ANALYSIS

3.4.1 The importance of quality of training

In trying to simplify HR matters, TNA is usually the result of performance evaluation meetings between employees and their supervisors. Any training needs identified would require training programs to be planned and implemented to meet those needs. However when the planning part is completed, best practice dictates that Planning must be followed by Doing,

Checking and Acting (Olian, Durham, Kristof, Brown, Pierce, & Kunder, 1998: 22). The doing component stresses the need to analyse the content of the training and development initiative, since employees' education and learning requires quality content. Bradley and Oliver agree that it is important for adult learners to understand why the content of what they are learning is relevant. They believe that it will allow future problem solving and perhaps even motivate the trainees through the perceived benefits of quality training content (Bradley & Oliver, 2002: 38).

In 1997, David Stamps coined the phrase "communities of learning" after dissuading his managers from embarking on a year long program to train customer service staff (Stamps, 1997: 35). Instead of forcing employees to spend time in classroom training, David suggested that the company (Xerox) organise employees in groups/cells so that teamwork could be involved in solving customer problems on the phone (Stamps, 1997: 36). The criticism levelled against training professionals in this case, was that they devised training programs that were far removed from the reality of the customer service employees. The outcome of starting a community of employees, was the continuous learning from the "more social" environment of training each other (Stamps, 1997: 36).

3.4.2 The aging future workforce

Another important reason to start TNA is that workers stay at work legally for longer, but at the same time, the entire workforce is aging (Dychtwald & Baxter, 2007: 325, Guthrie & Schwoerer, 2001: 59). Dychtwald and Baxter classify the time between 1946 and 1964 as that of the baby boomer generation (2007: 325). They predict that between the years 2000 and 2020, the baby boomer generation will increase the numbers of workers aged 55 and more, while those aged 35 and 54 would be categorised in the "no-population-growth" era. Dychtwald and Baxter attribute the American brain drain to older workers exiting the labour force and foresee about 35 million by the year 2030 constituting an American shortfall in "young-enough" skills (2007: 326). From an SCM perspective, older workers who retire take with

them the good relationships with business partners, suppliers and customers which organisations relied on (Dychtwald & Baxter, 2007:326).

The solution to their own identified problem, according to Dychtwald and Baxter (2007: 327), includes the following:

- Treat an aging workforce possibility as a business risk and forecast the number of workers aging and retiring
- Be flexible in planning retirement packages
- Make sure company recruitment policy can accommodate older employees
- Plan how to manage and motivate employees of all ages simultaneously

The Dychtwald and Baxter proposed solution to the aging workforce implies a need to encourage and commit financial resources to continuous training for *all* employees. This view is in contrast to a study by Patton and Pratt (2002: 480) whose focus groups discouraged management training to be made available to managers near to retiring. Taking into account a potential training program of 300 hours to be implemented over 2 years, they suggest that only new or potential managers should be trained. In 2002, they were already sensitive to the cost of training. Idaho State in the USA, offered one day of training at $100 per day (about R800.00). Comparing costs in 2012, shows that they have escalated since then and, even in the South African context, the costs of training will be an issue to resolve before anyone will be trained (Patton & Pratt, 2002: 481). The costs of training in South Africa average about R5000 for 3 days, which is double that of R800.00 per day ten years before.

The hypothesis deduced from the age variable is:

$H7_0$: There is no difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

$H7_A$: There is a difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

---

The TNA research study by Guthrie and Schwoerer was based on answering two research questions to determine the following:

- Does a direct relationship exist between career stage and the reported need for training?
- Does employee career stage bear any relationship to training self-efficacy, training utility (usefulness) and managerial support (Guthrie & Schwoerer, 2001:60)?

The research study found that if the older generation (i.e. late-career-stage employees) believe that they are less confident to pass courses, they declare that they have no need for training courses. If older employees do not feel supported by management on the subject of training, they may become prematurely obsolete. (Guthrie & Schwoerer, 2001:60). It must be noted that this study focused on "general management training"- not necessarily function specific training as is the case in SCM (Guthrie & Schwoerer, 2001:61).

Another hypothesis that examined the response includes:

$H8_0$: There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits.

$H8_A$: There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits.

Possible research variables that originate from the Guthrie and Schwoerer study include managerial support and training utility/usefulness. The current research project is also cautioned not to have stereotypes about how capable older people are when they are in training. Older employees are often disadvantaged by being viewed by managers and trainers as being less capable of learning. Older employees are also seen to be less desirable as candidates for training according to Rosen and Jerdee (in Guthrie & Schwoerer, 2001:60). Another caution regarding training utility when conducting the South African SCM TNA, is that if employees are negative towards training, they may under-report their training needs. In this sense

older employees may experience less learning and prevent skills transfer to the work environment

Perhaps in the context of the current global recession, workers may be inclined to continue working beyond normal retirement age of 65. Not only do human resources retire later in life; they are also living longer and need more finance for their long term survival. Since chronological age alone is conceptually inadequate to explain work experiences, (Guthrie & Schwoerer, 2001:60), previous work experience, not age will be more indicative of HR chronology. However, age is the most common indicator of career stage. The Guthrie and Schwoerer study involved 380 employees out of 715 public sector employees in Midwestern USA. With a 53% response rate, they found the average age to be 43 years. Employees were also employed for longer than six years in their current positions. The researchers classified employees aged 35 years and younger as being in the early career stage. The next section classified 36-49 year olds as being in mid-career stage. Employees above 50 years were considered late career stage (Guthrie & Schwoerer, 2001: 64).

The Guthrie and Schwoerer study is relevant since their questionnaire contained 30 managerial skills items. These items were reduced in factor analysis to basic management skills (13 items), with a Cronbach –Alpha (CA) of 0.96. The second factor was termed HR management skills (12 items), with CA of 0.96. Thirdly, they found the factor technical/communication skills (5 items) and CA of 0.85. It is noteworthy that these three factors together accounted for 69% of the variance in responses. One limitation of the Guthrie and Schwoerer study is that respondents were drawn exclusively from the public sector and this excluded the private sector respondents required for the SCM TNA study (Guthrie & Schwoerer, 2001: 59).

The industry studies still stick to simplistic approaches to TNA as shown by Gupta, *et al.* Any attempts to address the learning needs of managers or other staff through training programs, must include identifying gaps in the current versus desired conditions relating to knowledge and skills (Gupta, *et*

93

al. 2007:31). The pulse that measures knowledge and skills must be taken in the following circumstances (Gupta, *et al.* 2007:79), all of which are highly relevant to the current South African scenarios:

- when organisations undergo downsizing
- when existing training programs must be updated or revised
- when new business opportunities arise
- when jobs must be upgraded
- when new responsibilities must be assumed by people

3.5.   CONCLUSION

This chapter delved into the concept of TNA by explaining that it is only the first step in the training cycle. By investigating what skills, knowledge and attributes an employee possesses, any gap can be identified to help them fill job specifications. The older TNA models from the 1980s and 1990s were briefly explained and the constrained areas of investigation for this research study were restated. By questioning individuals themselves, TNA can find motivations to attend/request training. It is however important to contextualize these training needs within organisational cultures, structures and strategies.

Training needs can be expressed as the gap between the current state and the desired state of employee ETD. It is necessary in the next chapter to review which TNA studies have been conducted already within SCM, in order to contribute to South African TNA.

CHAPTER FOUR   SUPPLY CHAIN MANAGEMENT AND TRAINING

4.1.   INTRODUCTION

4.2.   SUPPLY CHAIN MANAGEMENT (SCM)

4.3.   DEMAND FOR SCM TALENT IN CHANGING MARKETS

4.4.   SOUTH AFRICAN SCM TRAINING NEEDS

4.5.   FUTURE SCM RESEARCH TRENDS

4.6.   CONCLUSION

4.1.   INTRODUCTION

In the last 3 decades (1980-2010) supply chain management (SCM) had to evolve from its narrow functional focus on purchasing, manufacturing and logistics to become more process optimised. This means that organisations had to learn to share information and collaborate with their business partners for the current business environment (Rossetti & Dooley, 2010: 43 Gattorna, 2003:6).

The objective of the research study is to address the HR training needs for a changing SCM environment. Before this can be done, the chapter has to determine how SCM is defined by organisations. Their definition of SCM will in turn affect how they utilise their scarce human resources. In due course, a few SCM definitions are highlighted in this chapter. These definitions allude to whether SCM principles or SCM processes are the main drivers in response to change. The need to define SCM is currently important due to the lack of consensus that exists between academic researchers and industry practitioners.

In Figure 4.1 below, the traditional silo-based functional view of a supply chain is drawn (Sherman, 2013: 55, Gattorna & Clarke, 2003: 632). Figure 4.1. assumes that the main direction of flow is from left to right, by moving from one business to the next in the chain link structure. This is intended to allow value to be added by each link in the chain to ultimately serve the customers' needs. Customers are made up of businesses, not individual members.   Left to right is also called "primary flow" or movement "downstream". Customers are located at the end of the supply chain, and receive goods and services in a business-to-business contracted relationship. Mangan and Christopher criticise this view since they require their supply chain view to include relationship management between a wider network of customers and suppliers, not merely a linked chain scenario (2005: 1).

Figure 4.1. The typical supply chain diagram

Figure 4.1. The typical supply chain diagram
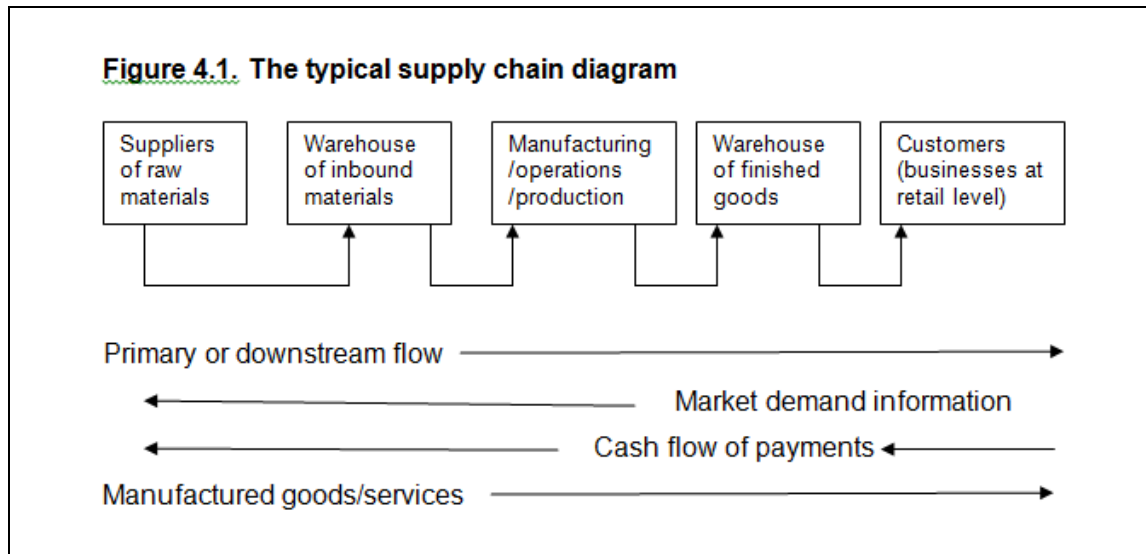
Source: Author's original design

Figure 4.1 depicts the three traditional main flows that constitute a generic supply chain. The three primary flows are generally accepted to include products/services, information and payments. Information flow is captured on the original source documents that accompany goods and services and that are used by bookkeepers to write up monthly and annual financial statements However, since 1961, the concept of SCM had been fleetingly introduced by Forrester as information, manpower, capital equipment and materials that flow and interact for the progress of industrial organisations (Giunipero, Hooker, Joseph-Matthews, Yoon & Brudvig, 2008:67). This valuable insight about SCM was forgotten between 1961 and 1981 and 20 years passed before it reappeared as a formal term of SCM during the 1980s. Perhaps the following overview of the SCM definition could help us to define SCM more clearly.

4.2.   SUPPLY CHAIN MANAGEMENT (SCM)

This section will trace the origins of the supply chain concept, comment on academic research written up about it and lead to how SCM links up with the training research problem.

4.2.1. ORIGINS AND EVOLUTION OF SUPPLY CHAIN MANAGEMENT

It is thought that the term SCM, was introduced by business consultants during the 1980s, but it was not widely used until the 1990s (Rossetti & Dooley, 2010: 41, Lambert & Cooper, 2000:66).   Different names existed previously to explain the practice of SCM. For example it was linked to either the areas of operations research or logistics. This implied that SCM was seen as a manufacturing or a transportation concern.

Perhaps SCM does not have one definition since it does not qualify as a regulated profession yet. Taken overall the SCM reviewed literature covering the period between 2006 and 2011 supports the fact that SCM is not yet singularly defined, nor regulated as a profession (Guinipero, *et al.,* 2008:78, Burgess, Singh & Koroglu, 2006: 703). Professionals such as accountants, lawyers, architects or medical doctors do not experience the same vagueness about the work that they do. These professions are characterised by strict rules and regulations, codes of conduct and standards to adhere to. Industry practitioners who work in marketing, material management, warehousing, transport or manufacturing all have their distinct definition of SCM (Frazelle, 2002: 5). By having so many definitions, the practice of SCM amounts to each functional business area speaking a different language while simultaneously trying to have the same conversation.

Despite the SCM body of knowledge being about 30 years young, there is a gap between academic research and business practice. On the one hand, research in academic circles needs to be scientific and objective, otherwise it is not rewarded with funding (Dess & Markoczy, 2008: 57). On the other hand, while academics stress the analysis of SCM research, managers are drowning in real-life complexity. This widens the gap between academia and industrial practice, and the latter judges SCM academic research to be neither practically useful nor relevant (Dess & Markoczy, 2008: 57).

Although the SCM definition from an influential industry association such as the Council of Supply Chain Management Professionals (CSCMP) is quoted in many literature reviews, it is still not to be regarded exclusively as the only correct definition of SCM (Gibson, Mentzer & Cook, 2005:23). The CSCMP definition posted on their website is as follows:

> *"Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."*
>
> *(Source: Council for Supply Chain Management Professionals)*

Although SCM cannot currently be discussed in universally accepted terminology, the literature published in academic journals still had to be reviewed for commonality. SCM definitions and concepts, despite being practically understood and workable, still lack even academic consensus! The following sections reconsider some of the defining academic conversations around SCM in the light of the international best practice way of defining SCM. In Table 4.1, some SCM definitions are listed with their sources. There is currently also no consensus amongst researchers about which functions and processes to include as SCM perfect standards of reference (Giunipero, *et al.,* 2008:81).

Table 4.1.   Various supply chain management definitions

Authors' references (in chronological order)	Supply chain management (SCM) definitions
Lambert & Cooper, (2000: 69), and quoted in Guinipero, *et al.*, (2008:81).	SCM is the flow of processes, information and goods from the originating supplier to the terminating customers. SCM consists of three interrelated elements namely the supply chain network structure, business processes and management components.
Mentzer, DeWitt, Keebler, Min, Nix, Smith & Zacharia (2001:4)	SCM is the strategic and systematic business function and tactics' co-ordination within an organisation and across organisations. In the structure of a supply chain (SC), the main purpose will be to improve long-term performance of all firms involved. A supply chain consists of three or more firms involved in moving finance, information, products and services both downstream and upstream from sources to and from customers.
Chen & Paulraj, (2004, 134)	SCM places emphasis on all aspects of products and services being delivered to customers.
Gibson, Mentzer & Cook (2005: 19).	SCM is not portrayed consistently since some definitions focus only on strategy while others focus on activities, processes or a combination of strategy, activities and processes.
Christopher, M. (2005:5)	SCM is managing upstream and downstream supplier and customer relationships such that higher customer value is created, but at less cost to the supply chain as a whole. In 1992, Christopher defined a SC as a network of organisations that produce value (Mentzer, *et al.,* 2001: 3, Christopher, 2005: 5).
Burgess, Singh and Koroglu (2006:703)	SCM is multidisciplinary and must use the Lakatosian program (core theory + other SCM theories) to expand the existing theory base.
Guinipero, *et al.,* (2008: 66)	SCM is a melting pot of purchasing, logistics, transport, operations and information technology. It involves the management of both materials and distribution.
Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. (2008:1)	A set of approaches used to integrate suppliers, manufacturers and warehouses to satisfy customers' need for the right goods and services, at the right price, delivered to the right locations within the right time. This integration should minimise costs efficiently.
Carter & Ellram (2009: 7)	SCM consists of triadic, not mere dyadic business relationships.
Stock, Boyer, & Harmon,	Since 1980s, the definition of SCM has changed many times

(2010: 32).	but 166 selected articles define it in terms of three main themes, which include SCM activities, benefits and constituent components.
Rosetti & Dooley (2010: 40)	SCM has two job functions that include firstly being the functional integrator and secondly also being the process manager.

Source: Own compilation of individual source references.

The SCM definitions listed in Table 4.1. are briefly discussed in the following paragraphs in a non-rigid chronological order. Mentzer, DeWitt, Keebler, Min, Nix, Smith & Zacharia, (2001:4) claim that despite the fact that SCM became popular to both practitioners and academics as a buzzword term, much confusion exists regarding its meaning. Mentzer *et al.*, state that the market demanded error-free, fast delivery of quality products in a global context as the new standard, and not as a competitive advantage. During the 1990s when SCM grew in popularity, Mentzer *et al.*, wanted to maintain a very definite distinction between supply chain (SC) that existed in business (similar to distribution channels) and the management of those supply chains (2001: 2). Mentzer *et al.*, see that the possibility exists for any organisation to be part of numerous supply chains (2001:4) and that supply chains can exist even if no one is managing them!

4.2.2. SCM AS PHILOSOPHY

In the light of the confusion that surrounded the term SCM in the 1990s, Mentzer *et al.*, assert that three categories of SCM theories exist namely SCM philosophy, the implementation of the management philosophy and a set of management processes (2001:5). In the first category of SCM as a management philosophy the following attributes apply:

- Approach the supply chain as a system where the total goods flow is managed from supplier to end customer.
- Use strategies to integrate within and among firms' operations
- Create unique sources of value to satisfy customers

In the second category of SCM defined by Mentzer *et al.*, they underscore the importance of implementation of the management philosophy. Mentzer *et al.* say it can be done when combining all previous research into seven meaningful SCM activities (2001: 8).

These activities are:

(a)   integrated behaviour between firms' customer needs and suppliers' behaviour

(b)   the mutual sharing of information between SC members

(c)   the mutual sharing of risks/rewards

(d)   cooperation between firms to complement and co-ordinate

(e)   a common goal and focus in serving customers

(f)   process integration

(g)   building and keeping partner relations in the long term (Mentzer *et al.*, 2001: 8).

It is my view that Mentzer *et al.,* are describing a futuristic utopia through these activities. No matter how expertly their management philosophy tries to manage their version of SCM, there are usually many contractual obligations that would be necessary to underline integration, co-operation and especially mutual risk responsibility.

In the third category of their understanding of SCM, Mentzer *et al.,* discuss a set of management processes. They move the focus away from the aforementioned SCM activities that take place. Mentzer *et al* encourage all participants to synchronise their activities according to specific times and places, making clear where the start, finish, inputs and outputs are (Mentzer *et al.*, 2001: 10). This implies that functions of SCM should be re-organised into a set of processes in order to satisfy relevant customers. For example, the functions that deal with the order fulfilment process must enhance the customer relationship management (CRM) process. In this way, Mentzer *et al.,* conclude SCM can be understood not only as a philosophy but as something that requires action to be practiced successfully. They believe this sheds more light on the previously confused definition of SCM.

Four years later, Mentzer would team up with two different authors and reflect in retrospect that previous authors had tried to define two distinct concepts with one SCM definition (Gibson, Mentzer & Cook, 2005:23, Mentzer *et al.*, 2001: 11). Together with Gibson and Cook, Mentzer concluded that the Mentzer *et al.*, 2001 SCM category of management philosophy, should rather be termed *supply chain orientation* (SCO) and that the category of *implementation* of the set of business processes should be known as SCM. Organisations wanting to implement SCM should first have an SCO. Also, an organisation with SCO by itself cannot implement SCM unless many firms in the same SC are co-ordinated and united in their strategies. These two concepts SCO and SCM should have antecedent trust and commitment for example, or else they cannot eventually have successful consequences of lowering overall costs or improving customer service. According to Mentzer *et al.,* in 2001, they defined SCM as listed in Table 4.1 above (2001:18), but in 2005, the new trio insist that academia and practitioners should both continue to play a role in evolving the SCM definition towards consensus. (Gibson, *et al.,* 2005:22).

4.2.3. ACADEMICS' AND INDUSTRY'S SEARCH FOR THE SCM DEFINITION

The gaps in the SCM definition and knowledge base motivated the Burgess, Singh and Koroglu study to use the 10000 articles in the ABI/INFORM electronic platform database. Burgess, Singh and Koroglu narrow articles down to include only peer-reviewed ones and then randomly selected 100 usable articles. For 90 % confidence, they needed only 61, but instead used 100 to diminish the Type II statistical error (Burgess, *et al.,* 2006: 705). The definition of SCM still proved elusive and was complicated by the many researcher backgrounds found by Burgess, *et al.* (2006: 715). The recommendations made by Burgess, *et al.,* include that SCM should be referred to as a network, not merely a chain of business partners (Burgess, *et al.,* 2006: 716, Christopher, 2005: 5). They also recommend that social

aspects such as trust and collaboration have been neglected, which would indicate a need for more psycho-sociological research (Burgess, *et al.,* 2006:716).

Burgess, *et al.,* think that original theories of SCM do not yet exist, since competitive advantage and cost economics appeared to dominate prior research (Burgess, *et al.,* 2006: 717). Although SCM is multidisciplinary, they found that experimental and mixed methods of research are lacking. Therefore Burgess, *et al.,* (2006: 719) call for a research program in SCM, not an SCM theory only. This would take future research efforts back to the 1974 Lakatos program where the core SCM theory is surrounded by other theories in a belt of shifts in SCM knowledge and research methodologies (Burgess, *et al.,* 2006:720). It is hoped that a new future research program approach may also enhance the narrow views of SCM beyond those of operations management and consumer goods (Burgess, *et al.,* 2006:721).

In my opinion the study by Burgess, *et al.,* had already criticised other authors' research methods and focus areas successfully. In the light of the modern millennium dilemmas of ethics and corruption, it would take many more decades of research to investigate trust and collaboration in SCM. Although people would be the subjects of the research direction proposed by Burgess, *et al.,* it is my view that people's decisions cannot be removed from either from their contextual circumstances or prevailing business conditions. As a result, I do not anticipate major changes in SCM literature any time soon.

Guinipero, Hooker, Joseph-Matthews, Yoon and Brudvig describe SCM as a melting pot of functions and disciplines but note that existing research investigates mainly one link in the supply chain (2008: 66). Guinipero *et al.*, comment that SCM literature reviews have thus far been fragmented and found them either purely descriptive or normative (2008: 67). The three-part goal of their research yielded firstly, a summary of previous SCM studies,

secondly gap identification for future analyses and thirdly some futuristic research recommendations (Guinipero *et al.,* 2008:67).

By using nine academic journals Guinipero *et al.,* divided 405 articles into subjects for content analysis. The nine journals were, in no particular order:

- The Journal of Supply Chain Management
- International Journal of Physical Distribution and Logistics Management
- Journal of Operations Management
- International Journal of Logistics Management
- Journal of Business Logistics
- International Journal of Operations and Production Management
- Industrial Marketing Management
- Management Science
- The Decision Sciences Journal

From these nine journals Guinipero, *et al.,* systematically review and briefly critique other preceding authors' SCM research *(*2008:67-69).

The Guinipero, *et al.* critique is meant to illustrate how far the SCM literature has come since its tentative beginnings by specifically commenting on the research methods used. For example, Guinipero, *et al.* reviewed the efforts of Rungtusanatham, Choi, Hollingworth, Wu and Forza who used six operations management journals to analyse 285 survey articles. In 2003, Rungtusanatham, *et al.,* discovered that research units of analyses, measures of reliability and validity were not present in many studies.

When Guinipero, *et al.,* reviewed the work done by Carter and Ellram during 2003, they found mail surveys for exploratory and descriptive research to be often used. Although means testing, factor analysis and regression were done, hypothesis testing was infrequent. Carter and Ellram, however, confined themselves to 774 articles found in the Journal of Supply Chain Management, published in the 35 year period between 1965 and 1999.

Guinipero, *et al.*, noted that the Journal of Supply Chain Management published more SCM articles after 1990, which are fortunately included in the 1980 to 2000 time period they had investigated. Following up on their own research from 2003, Carter and Ellram became the editors of the Journal of Supply Chain Management. By using a literature review process to map future research approaches, together with Kaufmann in 2008, Carter and Ellram stressed the need for SCM research to have managerial relevance (Carter, Ellram & Kaufmann, 2008: 7). The Carter *et al.* recommendations for future research are highlighted in the section on future SCM research trends, which follows towards the end of this chapter.

Through their own research effort, Guinipero, *et al.,* tried to overcome any shortcomings from past studies. They noted that in the literature they studied, previous units of analyses consisted of either surveys of, or interviews with respondents. They record that currently SCM must be studied as an accepted part of central corporate strategic planning (Guinipero, *et al.,* 2008:70). They found that SCM strategy, frameworks for trends and business relationships are the three top areas in which research has lately been published. The Guinipero, *et al., (*2008:76) future research recommendations include a further division of the partner relationships section into arm's length, transactional and integrative types of business relationships. They concluded this by stating that power, risk and commitment may vary between business partners.

Guinipero, *et al., (*2008:78) opine further that past research methodology used only basic data analyses such as description, testing means, analysing content and correlations. They suggest that future data analyses should include factor analysis, analysis of variance, the modelling of structural equations plus cluster analysis (Guinipero, *et al.,* 2008:78). Unexpectedly, the call is also made for social network analysis to be conducted when researchers and practitioners attempt to answer more complex research questions in future (Guinipero, *et al.,* 2008:79).

Besides the need to evolve their traditional SCM focus, the changing business environment also necessitated SCM growth. This entailed growing beyond traditional business practice such as shown in the linked chain in Figure 4.1. This change was influenced by technological advancement in SCM and the drive to increase global competitiveness. The business environment experienced lower costs of production and reduced product life cycles. The latter was in part due to mass customisation prompted by more demanding customers. Businesses were also subjected to more pressure to survive since a virtual world made demand and supply information travel much faster than before (Gattorna, 2003:6). Organisations who did not adopt the technological integration with business partners slowed themselves down as the market environment changed (Gattorna, 2003: 7).

The complexity of research questions is probably dependent on the complexity of the SCM definition in the first instance. Simchi-Levi, Kaminsky and Simchi-Levi (2008:1) define SCM as a set of approaches used to integrate suppliers, manufacturers and warehouses to satisfy customers. The latter need the right goods and services, at the right price, delivered to the right locations, within the right time. This integration should minimise costs efficiently which concurs with the costs theory postulated by Carter, Ellram and Kaufmann (2008:5). Since 1989 the CSCMP has compared the total costs of logistics and inventory as a percentage of the United States gross domestic product, to determine whether costs are efficient (Simchi-Levi, *et al*, 2008:7). This encouraged other researchers to track costs as a performance indicator in the SCM field, in the light of the integrated view of SCM as defined by Simchi-Levi, *et al.* (2008:7).

In another qualitative study, Stock, Boyer and Harmon agreed on three main SCM themes as a definition. They identified the themes from the qualitative analyses of the ABI/INFORM electronic platform database research articles (2010:32). Amidst thousands of articles and books sifted, the three common themes were derived through the authors' content analysis of the 166

uniquely defined SCM articles (Stock, *et al.,* 2010:33). Stock, *et al.,* included SCM activities, benefits and constituent components as their three common themes of a SCM definition (2010: 35). The authors see activities firstly, as including the two-directional flow of goods/services and information. This two-way flow is based on internal and external relationships between members of the same supply chain. Secondly, SCM benefits are the results of correctly implemented SC strategies. Benefits derived from the SCM implementation include value being added to products and services. This has a spin-off effect of creating efficiencies from limited resources and increasing customer satisfaction as the ultimate benefit of SCM (Stock, *et al.,* 2010:34).

The third theme, constituent components, cannot be left out since any supply chain consists of business functions that constitute part of business partners' systems and operations (Stock, *et al.,* 2010: 35). By and large, the Stock, *et al.*, meta-analysis appears to be a synopsis of every aspect that is involved in SCM. However, they do not perceive their research to have been conclusive. Judging from their research findings, Stock *et al.*, recommend a variety of future research areas derived from the three common themes they arrived at. One of their main recommendations is for future research questions to find out which services, if implemented successfully, add more to SCM success than others (Stock *et al.,* 2010: 35). Another main recommendation will be discussed together with that of Rossetti and Dooley, which follows.

The Stock, *et al.*, authors used a qualitative software program named NVivo, to search through the ABI/INFORM electronic platform database for unique SCM definitions published between 1980 and 2004. A similar form of electronic content analysis was also followed in the research study by Rossetti and Dooley, who investigated 546 SCM job descriptions in seven months of 2007, in order to understand SCM better (2010:44). Rossetti and Dooley concluded with three main job categories, which are sourcing, operations consulting and information management. This is similar to the third theme put forward by Stock, *et al.,* where SCM is defined in terms of constituent components such as systems and operations (Stock, *et al., 2*010: 35).

Rossetti and Dooley further summarise their findings as a dual definition of SCM where a business organisation is either functional integration focused or process improvement focused (Rossetti & Dooley, 2010: 44). The emphasis they placed on job descriptions led them to believe that supply chains constantly evolve and that an SCM job description differs from one business partner to the next. They warn future researchers never to address research instruments to particular job titles since SCM jobs are neither defined nor constant in practice (Rossetti & Dooley, 2010: 53).

The Stock *et al.*, study further found that so-called strategic partnerships or alliances amongst business partners consisted of research done between only two business partners. They therefore warn that for future SCM research to be valid, business relationships should be seen as a network of more than two partners (Rossetti & Dooley, 2010: 53, Stock *et al.*, 2010: 35). Researchers Rossetti, Dooley and Stock *et al.*, all recommend that activities between multiple business partners should be examined in future studies as well (Rossetti & Dooley, 2010: 53, Stock *et al.*, 2010: 35). This request for multiplicity concurs with Carter and Ellram who asserted that triadic, in preference to dyadic business relationships should be included in future research (2009:6). This was also previously mentioned by Guinipero, *et al.* (2008: 73), who noted that supply chain networks, not the relationships between a few partners, should be studied. The Guinipero, *et al,* levels of analysis were in ascending order: the one firm level, the dyadic level, the chain level and the network level (Guinipero, *et al,* 2008: 73). They do acknowledge that the network level of analysis is challenging to most researchers who are constrained by time and funding at any given time (Guinipero, *et al:* 2008: 73).

In summary of this section, we confirm that most authors agree that there is no consensus on the SCM definition amongst academia and practitioners. They do however agree that business organisations should offer their customers benefits in exchange for products, services and information required in a complex market environment. More than two business entities

must be acknowledged from a networked supply chain, in order for results to be more meaningful in future. While SCM can have a philosophical supply chain orientation, on the hand, it must be practically implemented through business processes and activities. Furthermore since the SCM arena is constantly evolving, researchers should not be rigid in their job descriptions. Under no circumstances should anyone claim that any SCM definition is the only usable and correct one.

Although Table 4.1. highlighted some viewpoints on SCM, the definition that will be used for this research project will be the expanded conclusion of some of the preceding views.

For the purposes of this research study SCM is defined as a network of business partners interdependent on strategically related activities and processes to serve customer needs.

In conclusion: the research studies discussed thus far, focus only on the definition of SCM and the research studies that took place whilst the SCM definition was still in a state of flux. The next part of the discussion takes into account how SCM itself has grown along with socio-economic and industrial practice changes.

Since SCM consists of people running business organisations, the next specific area for investigation zooms in on HR skills and abilities, which they apply with a view to the success of their employers. The following section on demand for SCM talent also delineates the South African environment in relation to the rest of the world in order to place the human resources (HR) training needs into context.

4.3. DEMAND FOR SCM TALENT IN CHANGING MARKETS

This section summarises the findings of research related to the demand and supply of SCM talent. Employers need human resources (HR) on the demand side of the economy. The human resources with related skills are provided by labour and this constitutes the supply side of the economy. The discrepancy or gap between the numbers of HR members required and provided, can be labelled a skills surplus (supply >demand) or a skills shortage (demand > supply).

Table 4.2. briefly lists the authors who will be discussed in this section on demand for HR in SCM in chronological order.

Table 4.2. **Brief findings about the demand for human resources in supply chain management**

Author(s) and year of publication	Main finding(s)
Frazelle (2002: 3)	Supply side lacking: the employed human resources do not have the necessary SCM skills and yet management has to train staff in order to retain them.
Melnyk & Sandor (2008:6)	Supply side lacking: the lack of talent hinders post 2010 SC success
Othman & Ghani (2008:260)	Demand side lacking: SC partners need to develop similar HR practices if they need to respond to market requirements in a collaborative effort.
Aquino & Draper (2008: 13)	The demand from industry is for university graduates to be generalists, who can be trained into specialists as needed. If university and professional training programs cannot incorporate industry needs in their curricula, leaders in SCM may need to self-train or pay for subject specific expertise.
Dischinger, Little & Kellso (2008: 21)	The gap lies in articulating the supply chain requirements more clearly by finding common descriptors for the SC and the skills required. Thereafter the human resources can be trained according to the skills level requirements.
La Londe & Ginter, (2009:30)	List the top five challenges that were identified by the logistics and SC executives for the 2009 research study. Main challenge is to lay off staff in recession with no detriment to their own demand. Thus labour supply > demand.

Source: Original summary of referenced authors

In 2002, Frazelle highlighted the point that SCM was sourcing human resources across many disciplines but that only a small percentage of those employed in these industries actually had formal training. Frazelle observed this phenomenon as early as in 2002 namely that SCM staff was in high demand. This was shown by regular staff turnover. Frazelle thought that high performing HR could only be retained by further skills development and the organisation's investment in staff education (Frazelle, 2002: 343). This need for skills development existed against a backdrop of growing industry complexities. Business organisations needed tools, technology and training to keep up with the changing complexity and skills demands (Frazelle, 2002: 3). This brings us to the issue of unmet skills required in SCM.

4.3.1.   THE CHALLENGES OF UNMET SKILLS IN SCM

Between September 2006 and October 2007 Melnyck and Sandor tried to identify the obstacles facing supply chain organisations in order for them to be successful beyond the year 2010. The study found that the major obstacle facing modern day organisations is lack of talent management and leadership. This hinders organisations' efforts to prepare for the requirements of the future supply chains (Melnyck & Sandor, 2008: 6). They used two American and one European site to compare industrial and academic respondents' views through three workshop locations. Melnyck and Sandor complain that currently, the managers produced by universities, colleges and professional societies are primarily functional in training and tactical in execution. They say that organisations need managers with a cross-functional orientation, who can be integrative in perspective and strategic in orientation. The problem is that there is no supply of such managers readily available. Melnyck and Sandor argue that in order to make the most effective use of the new supply chains, the right type of managers must be found (2008: 6). Finding the right managers includes the need for SC partners to develop similar HR practices if

they need to respond to market requirements in a collaborative effort (Othman & Ghani, 2008:260).

In a study succeeding the research done by Melnyck and Sandor (Melnyck & Sandor, 2008:6), the American Ohio State University, conducted the 2009 annual Survey of Career Patterns in Logistics. Two researchers, La Londe and Ginter, undertook this survey of career patterns after the 2008 global economic meltdown. During the 2008 to 2009 global recession many skilled and semi-skilled HR were facing retrenchment all over the world. The La Londe and Ginter research survey sample size of logistics and supply chain executives consisted of 2265 e-mails that were sent out and yielded a 5,5% response rate. Of the 124 respondents 84,6% were male and 15, 6% were female, which closely resembles the likely scenario for the male-dominated SA market. Most of the respondents were between the ages of 50 and 55 years of age, although the common age range for logistics and SC executives is around 45 and 49 years of age (La Londe & Ginter, 2009: 6).

The largest section of the La Londe and Ginter respondents (31%) came from the food and consumer packaged goods category. The retail and wholesale category was next with 14%, followed by the industrial/electronic and mechanical category at 11%. The popular 2009 SC slogan was to be "lean and green" although the green initiatives were slowing down. The 2009 study highlighted that one of the main challenges were still to forecast product demand better. This challenge was compounded by the reality of having too many forecasts to choose from, which is normal during recession times (La Londe & Ginter, 2009: 30).

According to La Londe and Ginter, the top five challenges that were identified by the logistics and SC executives for the 2009 research study were:

Challenge 1= firms need to manage the global SC structures while simultaneously making serious changes to their operations.

Challenge 2 = managers had to reduce inventory without negative impact to customer requests and also decrease labour without lessening their organisations' most important skills bases.

Challenge 3 = managers were faced with contradictions because they had to plan as if the markets were deteriorating yet also position their businesses as if they were experiencing an improvement in the market environments.

Challenge 4 = managers had to attempt to redesign operational processes and restructure their entire supply chain structures at the same time.

Challenge 5 = managers still had to provide for their firms' cash flow requirements while trying to act on the listed 4 challenges.

La Londe & Ginter (2009: 31) agree that each industry faces different challenges and will respond to forecasts and opinions as required. They note that the top five challenges all point to the extremes of supply chains and economic uncertainties. For 2009 it presented difficult decisions for managers to make regarding the staff complement that they required then versus their future training needs.

In 2008, another study also tried to predict what skills would be required in supply chains in 2010. This research study was done by AMR Research and the American Supply Chain Council (SCC). They probed respondents amongst director level practitioners (Aquino & Draper, 2008: 2). What made this research study different was that 91% of the respondents were hired by their organisations only in the preceding year. The respondent large organisations had more than 10000 employees (52% of the respondents) and more than $5 billion annual revenue (49% of the respondents). The 287 respondents' view on skills demanded versus skills available in the year 2010 are summarised in Figure 4.2.

Figure 4.2. Results from the 2008 AMR study on SC skills available versus those prioritised in 2010.

SKILLS DEMAND MAP
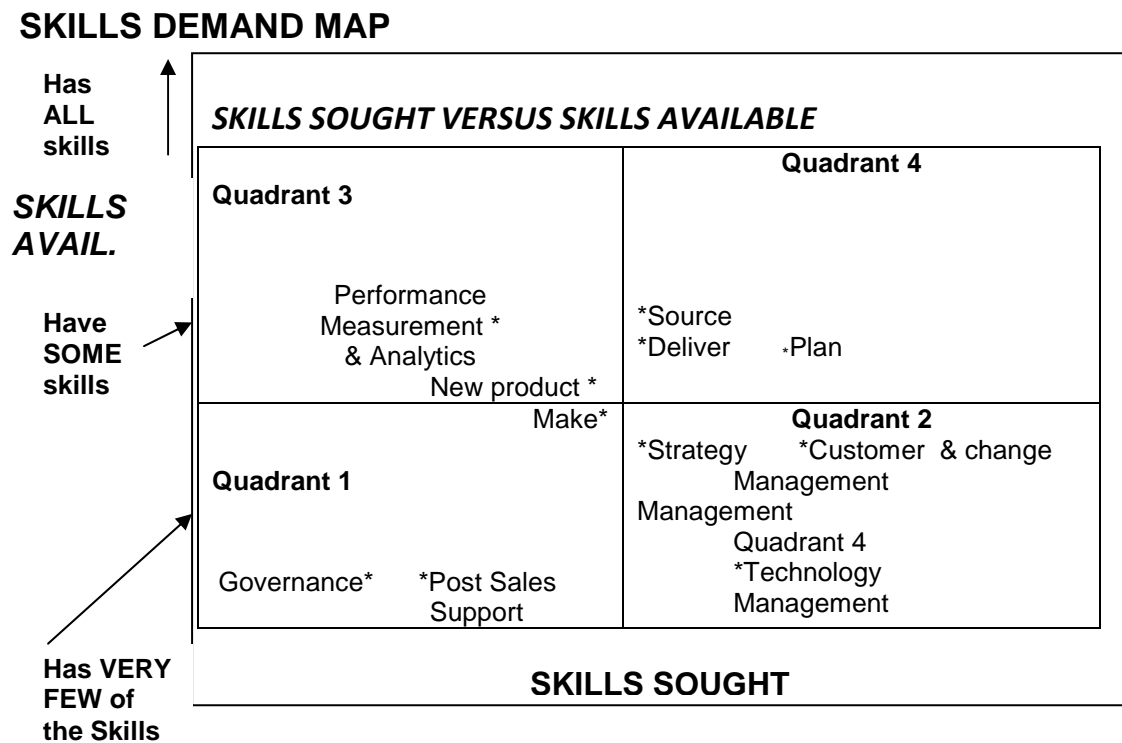
Source: Adapted from AMR research by Bridget McCrea (in Aquino & Draper, 2008: 13)

In Figure 4.2. the basic and intermediate skills being "sought after" but that are "not available" include the skills required in corporate governance and post-sales support (This is designated Quadrant one). The advanced and leadership or strategic skills being "sought after" but that are scarce, include those required for strategy and change management, customer management and technology enabling (Quadrant 2). Since these are the views of director levels and above, their emphasis is also expected to be on higher-level skills (Aquino & Draper, 2008: 2). Quadrants three and four are in a happy state where skills sought can be filled, by the market. A key finding from this survey is that half of the 287 respondents believe that they can recruit staff with no particular speciality and train them to reach the required skill levels. The

demand from industry is for university graduates to be generalists, who can be trained into specialists as needed (Aquino & Draper, 2008: 13). Also, industry could use higher-level understanding where potential employees see their functions as integrating into interdependent SC elements (Aquino & Draper, 2008: 13).

In 2008, Dischinger, Little and Kellso would firstly ask whether companies are clearly articulating the skills they demand in order for their supply chain programs to be adapted to world market requirements. Secondly, they questioned whether universities are responding effectively to the need to match the demand and supply of supply chain talent and skills. If both questions could not be answered, they introduce a third question whether SC associations should not be actively involved in letting other partners collaborate in the process of skills development (2008:4). Dischinger *et al.* were commenting on the research done by Aquino and Draper and presented their findings at the 2008 conference in Denver, Colorado. Since American businesses use professional recruitment agencies to find executive level recruits, it is logical that Dischinger, *et al.* are not expecting universities to adapt their training programs drastically, nor are they placing responsibilities on the professional SC associations to find the skills required (Dischinger, *et al.*, 2008: 21).

The conclusion drawn from the three questions that Dischinger *et al.*, asked is that their first question remained unresolved. The gap for Dischinger, *et al.*, lies in articulating the SC requirements more clearly by finding common descriptors for the SC and the skills required (2008:21). This concurs with the Aquino and Draper (2008: 2) attempt to develop a common SC talent attribute model between academia and business organisations. If university and professional training programs cannot transpose industry needs into their curricula, leaders in SC may need to self-train or pay for subject specific expertise. This also requires leading organisations to integrate SC talent and performance management with HR initiatives (Aquino & Draper, 2008: 19).

This conundrum of universities training enough skilled graduates versus whether it is the business organisations' responsibility to train enough SC staffers, will not be resolved overnight. The following section discusses the effect of HR training and skills in SCM.

To summarise: the main points to be derived from the issue of demand and supply in SCM talent is that specific market characteristics influence demand and supply. Recession may cause supply to exceed the talent demanded by industries. Similarly a lack of training and/or training of the wrong skills set for managers may cause the talent supplied to be less suited to what is demanded. An encouraging thought is that generalist skills are in demand in order to be trained in becoming SCM specialists. More HR training and SCM skills research literature will be highlighted in the following section.

4.3.2. WOMEN AND SKILLS DEVELOPMENT IN SCM

In the next section the influence that HR training can have on the skills demand will be investigated from secondary sources. A current view is that HR training can affect the competitive survival of business organisations. Gattorna asserts that the future requires competing supply chains to source and obtain completely new capabilities to stay competitive and that talent (HR) will be at a premium (Gattorna, 2006: 6). Since many industry types demonstrated a collective need for skilled SCM staff, the demand for SCM training itself becomes a derived demand. This means that the need for SCM training is dependent on the SCM skills' demand.

The CSCMP believes that training program content must be updated routinely but must correlate to the strategic objectives of the organisation. They urge that widespread access to both training and training information is necessary. The results of three separate annual (2007, 2009, 2012) surveys done by the CSCMP will be discussed in the subsequent paragraphs.

This proposed research study was based on the premise that training should not be conducted without having a background of the HR needs already in existence. For this reason, a study that identifies the changing needs of the female half of the labour force is worth noting. The recurrent survey being conducted by the Council for Supply Chain Management Professionals (CSCMP) focuses on the career patterns of executive level women in logistics. Some of the 2007 *career patterns of women in logistics* findings will be discussed first, before more general research studies will be reviewed in this section.

The eleventh annual survey done by the CSCMP focused on the *career patterns of women in logistics*. Cooper, Santosa and Burgos-Dominguez focused on six research questions for the year 2007. Their methodology involved sending out questionnaires to 873 listings from the year 2007 membership of the CSCMP. They also e-mailed 466 out of 1301 non-members, which is not their usual practice. In order to increase the sample size they included 896 from 1055 past members. The outcome of this was that undeliverable e-mail reduced the sample from 2235 to 2037, of which 234 responses were usable. This equates to an 11.5% response rate for the year 2007 study. The authors point out that the results of this study should not be generalized to all women in the general practice of logistics (Cooper, Santosa & Burgos-Dominguez, 2007: 2).

The demographics of the all-female respondents in the 2007 study were:

- Women ranging in age range of between 35 and 51 years (about 79% of the sample)

- Those who are younger than 30 are only 6% and those over 50 are about 15%

- Their marital status indicates that 65% of the respondents are married, 18% are single and 17 are divorced

- Their levels of education show that the greater percentage (40%) have only an undergraduate degree, while 38% have a graduate degree

(mostly an MBA degree) and additional certification applies to 8% of the respondents

The 2007 CSCMP study cannot be generalized to the South African context since the demographics of the South African study are different.

Table 4.3. summarises the 2007 findings based on the following six recurring research questions:

- What are the respondent demographics of the logistics executives?
- Describe the work environment of the respondents.
- What are their career patterns?
- What are their attitudes and perspectives?
- What is the role of mentoring in their careers?
- What views do the women have on globalisation?

Table 4.3.   Brief findings about the 2007 CSCMP Career patterns of women in logistics study.

Authors: Cooper, Santosa and Burgos-Dominguez	
Main findings of the 2007 *career patterns study*	
Demographics	Used 234 response out of 2037 sample size About 79% of the women's ages ranged from 31 to 52 years and 65% of respondents were married. Education levels were at undergraduate level (40%), graduate degrees (38%) and additional qualifications (8%).
Work environments:	Managers (35%), directors (21%) and vice-presidents (21%) with either direct/advisory responsibilities in logistics or both
Career Patterns:	Participative management styles, where leading and building consensus prevails.
Perspectives:	90% felt that career prospects were better than ever before.

Mentors:	Provided guidance, support, advice, moral support, constructive criticism, insight into politics, networking and job hunting assistance.
Globalisation	Since their supply chain partners were global, cultural understanding was seen as key to success, besides relationship and strategic management.
My conclusion: the 2007 *career patterns of women in logistics* study yielded no major HR training requirements for the future success of the executive women in logistics.	

Source: Adapted from Cooper, Santosa and Burgos-Dominguez (2007: 2-6)

Since the CSCMP study is an annual recurrence, I wished to skip a year in order to detect changes in the focus of the research questions or the supply chain environments more easily. This decision is supported by the results of the study the year immediately following the 2008 recession, where we saw the skills gaps and job insecurity starting to feature. The 2009 questions focused on career expectations and perceived knowledge and skills gaps. The 2009 study was a special edition and therefore did not use the 6 research questions from the 2007 study. The 2009 research contained two enquiries where one was about retirement views and the other question was about skills gaps.

While the demographic profile did not alter radically, their job titles and retirement views differed. More junior staff expected to retire before the age of 55, whilst only 19% of vice-presidents agreed with them. The mean perspective was that they could potentially lose their jobs while about a third felt there was a realistic chance of being fired/retrenched.

Cooper, Santosa, Coley and Hurst conducted the 2009 CSCMP logistics study. While the CSCMP 2007 study investigated six research questions, the 2009 *career patterns of women* study investigated three main themes. The

first two 2009 themes attempted to determine the retirement age and ultimate positional title that women expect in their careers. The 2009 study's third theme included questioning women on whether they were sure of job security in recession. The responses for ideal retirement age were inconsistent and ranged from "hoping to retire" before the age of 55 (idealistically) and "hoping to retire" at the age of 65 (realistically). The issue of age is applicable to the South African study since the literature reviewed was inconclusive on the status and behavior of the aging working population.

The 2009 CSCMP logistics study's second theme dealt with business-related titles and hierarchical positions and is not directly relevant to the South African study. However, the 2009 CSCMP study yielded valuable findings of key skills and knowledge gaps that respondents think are required for leaders and managers in SC today (Cooper, *et al.,* 2009: 7). The 2009 CSMCP women perceived that the key skills and knowledge gaps for managers include (in no particular order):

- Developing skills specific to SC such as SC metrics, is necessary.
- Leading, managing and forming teams with others are necessary business practices
- Professional development by having a mentor, for instance, is important.
- Dealing with discrimination (by males) and to work across cultures must be addressed.
- Important elements currently missing are the need to develop integrity and to stay in a job long enough to learn.
- Managing both individuals and the big picture beyond silos, is important.

The only finding from the 2009 CSCMP study that has a direct link to this South African study, is investigating whether women experience gender discrimination by males or not.

From the gender related SCM studies, the following hypothesis is again reinforced for inclusion in the empirical research project:

$H6_0$: There is no gender-based difference in the perception that female employees receive more training than males

$H6_A$: There is a gender-based difference in the perception that female employees receive more training than males

The 2009 CSCMP *career patterns of women in logistics* study is relevant since it highlighted some of the respondents' *personal* knowledge and skills gaps (Cooper, *et al.*, 2009: 8). The 2009 CSCMP study reinforced the need to include respondents from both management levels and ordinary workers' levels in the research methodology of the 2011 SA research project. The personal training challenges or gaps from the 2009 CSCMP study include (in no particular order):

- Respondents struggle to remain up to date since they are being constrained by an education and training budget that is small or non-existent.
- Women think that they need to develop more strategic thinking.
- Women claim they are unable to make rapid adjustments to leadership and other changes.
- Women state that they do not have nearly enough knowledge about international shipping practices.
- Women find there a deficiency in the provision of skills around logistics and SCM.
- Women also find, themselves, to be in need of knowledge about finance, profits and losses.
- There is a challenge to keep up to date, in the face of insufficient exposure to information technologies.
- There is a need for formal education, degrees, SCM-specific and foreign language education.
- Mentoring and coaching in personal development are urgent requirements.

- Women need men to support women in obtaining the job that they are qualified for, instead of running into boys' club resistance in the workplace. A comparison between the 2007 study and current conditions seemingly showed no change in this finding.

In conclusion, the 2009 CSCMP *career patterns of women in logistics* study remained optimistic about the future of women in logistics (Cooper, *et al.*, 2009: 9).

The summary in Table 4.4. must be interpreted in the context of the global recession and in the light of the additional challenge of an aging American workforce. Note that, according to Table 4.4 women executives first responded to general leadership issues before addressing their own personal skills gaps.

Table 4.4.   Summary of knowledge and skills gaps highlighted in the 2009 CSCMP career patterns of women in logistics study.

Lack of understanding regarding world trade economics, changing technology and planning for HR challenges.
Lack of international experience, and insufficient knowledge about international and local trade policies.
Lack of Masters in Business Administration (MBA) level of qualifications or graduate studies for leaders in SCM.
Lack of leadership skills that include emotional intelligence soft skills, collaboration and speaking languages other than English.
Lack of additional development in mentoring skills and networking skills.
Lack of workplace cultural changes to build more relationships across cultures and gender.
Lack of developing in-depth talent, across functions and of integrity.
Lack of understanding of big picture view on the entire supply chain.

Source: Adapted from Cooper, Santosa, Coley & Hurst (2009:7)

Personal skills gaps that were identified in the 2009 study showed that :

- formal education, including management and supply chain specific education, was needed.

- there were gaps in Information technology, systems and software
- accounting, finance, profit-and-loss knowledge was needed
- supply chain business functions such as marketing and transport, were lacking
- knowledge of international logistics and SC was required
- strategic leadership skills in order to respond to emerging trends were lacking
- management development was curtailed due to limited or unavailable training budgets

A review of the above studies indicates that skills development became important in the light of serious job market insecurity and aging and other related changes. Both organisational learning and personal skills development requirements presented themselves as needs in the 2009 *career patterns for women in logistics* study. The SCM research thus influenced the design of the research project through the hypotheses formulated below. The 2009 findings called for the gaps in both functional skills and emotional quotient soft skills to be addressed, as in Table 4.4.

$H1_0$: There is no significant difference in the training received by managers and employees in the preceding 12 months

$H1_A$: There is a significant difference in training received by managers and employees in the preceding 12 months

$H2_0$: There is no significant difference in the format of training preferred by managers compared to employees.

$H2_A$: There is a significant difference in the format of training preferred by managers compared to employees.

$H3_0$: There is no significant difference in the reasons motivating employees to attend training

$H3_A$: There is a significant difference in the reasons motivating employees to attend training

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Considering that women make up half the population in most countries, their education and the views they have about skills development and training are indicative that training needs analyses are important enough in logistics and SCM.

Therefore the following hypotheses are also included in the research project:

$H4_0$:   There is no significant difference in the reasons demotivating employees and managers from attending training

$H4_A$ There is a significant difference in the reasons demotivating employees and managers from attending training

$H5_0$ There is no relationship between existing educational qualifications and urgency for employee training

$H5_A$:   There is a relationship between existing educational qualifications and urgency for employee training

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The variables that were tested in both hypotheses 3 and 4, will be delineated in chapter five. Chapter five will expound on the research design and methodology in finer details.

In order to plan for future requirements, the 16th c*areer patterns of women in logistics* study took place in 2012 and is summarised in the same format as the 2007 study in Table 4.5. Although these findings are presented here; they were too late for inclusion in the 2011 training needs analyses research project, which is the focus of this thesis.

Table 4.5.   Brief findings about the 2012 CSCMP study: Career patterns of women in logistics.

Authors: Cooper, Santosa and Burgos-Dominguez	
Main findings for the 2012 *career patterns of women in logistics*	
Demographics	Used 185 responses out of 1093 sample size. Response rate is still 5% higher than the 2007study. About 59% of the women's ages ranged from 31 to 50 and 71% of respondents were married. Education levels included undergraduates (46%), graduates (44.5%) and additional qualifications (8%).
Work environments:	Directors (29%), managers (28%), and vice-presidents (16%) with either direct or advisory functions or both as their primary responsibilities in logistics.
Career patterns:	Participative management styles, where facilitating decisions rather than directly ordering decisions prevailed.
Perspectives:	86% felt that prospects to build a solid logistics career were better than ever before. Compared to the 2011 (88%), the 2010 (86%) and the 2009 (84%) perspectives.
Mentors:	The roles of mentors were unchanged. They provided guidance, support, advice, moral support, constructive criticism, insight into politics, networking and job seeking assistance. 75% of respondents acknowledge that they did have a mentor at some point.
Type of management style used.	Decisions were considered rationally, systematically and with caution. An individualistic corporate culture existed in which respondents did not see others being treated as family members or in a welfare-oriented way.

Source: Cooper, Santosa, Hurst, Sanders, Andic & Polyviou (2012: 2-7)

The MBA appeared as the most frequently listed graduate qualification in the 2012 study, which is a positive response to the need for this in the 2009 study. Although the authors caution about generalising the findings of their Career Pattern series, this suggests personal development and growth where perceived needs existed three years earlier. They label their sample as biased since the CSCMP is the leading professional association for logistics and SCM professionals. The contrasting view of sampling is held for the current study since the supply chain organisations and respondents were specifically targeted to increase the validity of the findings.

To summarise the findings of the *career patterns women in logistics* studies, the 2007 career pattern study yielded no major HR training requirements for the future success of the executive women in logistics. The unexpected 2008 recession probably brought the fear of losing their jobs even amongst the women in logistics. An interesting observation is that skills development, organisational knowledge requirements and personal training needs featured in the uncertain 2009 global business environments. This could have been an environmental concern affecting the sentiment of the current research project, although the research instrument did not measure fear of job loss. The next section moves away from gender specific views to the secondary research about gender inclusive skills requirements.

4.3.3. ADDRESSING FUTURE SKILLS GAPS

In an attempt to assess where SCM skills gaps are and will be in the new millennium, more recent studies are reviewed in this section. Table 4.6. returns to the gender inclusive research studies conducted with regards to HR training and skills development in SCM.

Table 4.6. follows on the next page…

Table 4.6. Brief findings about human resources training and skills in supply chain management

Authors	Main findings
Bowersox, Closs & Stank, (2000: 12)	Predicted ten mega-trends that would revolutionise SC logistics back then. Although training is listed at number 9, training SC logistics HR was already imperative at the start of the millennium.
Grant (2001: 574)	Further education and training (FET) is a given in order to add value to SCM.
Gowen III & Tallon (2003:34)	Train and re-train employees since best practice firms view training HR as a strategic need in order to excel in SCM. The best practice SCM training and re-training of staff, is important especially in times when environmental changes take place.
Myers, Griffith, Daugherty & Lusch (2004: 224)	There are certain job skills that are making SCM employees more valuable than others and compensate for a lack of education. These include social skills, decision-making skills, problem solving and time management skills.
Chen & Paulraj, (2004: 151)	The true dynamics of SCM is not clearly understood. The research theory lacks clarity
Othman & Ghani (2008: 259).	The level of SCM linkages amongst firms will determine the HR practices they adopt.
Keller & Ozment, (2009: 385)	It is necessary to recruit skills for logistics at early management levels
CSCMP, (2010: 52).	There is currently a need to "train the trainer"(e-book)

Source: Author's own summary of referenced authors

In this segment, the incidences of training in SCM principles are examined as they appeared in different research studies. Whether training took place in academia or in practice made a difference to the value associated with skills and the knowledge transferred. It is hoped that the existing gap in the SCM skills being supplied to business organisations can be addressed by referring to prior studies completed outside South Africa. The flow of this section follows a chronological sequence in order to identify previous training gaps and to determine whether these gaps are currently resolved or not.

At the start of the new millennium, Bowersox, Closs and Stank (2000: 12) predicted ten mega-trends that would revolutionise logistics and supply chain (SC) management. The authors' point of reference is that integrating SC logistics would improve the value that the end customers would receive. The end customer's perceived value would have to be interpreted from at least three points of view. From the first perspective customers are price sensitive and look for economic value (Bowersox, *et al.*, 2000: 1). The second customer perspective on value focuses on convenience and a variety of products/services and is termed "market value". Thirdly, the perspective that things can influence the way customers work and the way consumers live, is termed "customer value" due to its relevance (2000: 2). The challenge to firms in the year 2000 was to improve their offerings and structure themselves to be positioned in the technological 21st century. This means that all firms have to accept the revolutionary challenge and adapt to new definitions of customer value.

In 2001, Grant conducted a research survey from point of the view that the aim of further education and training (FET) is to add value to SCM (2001: 574). While block courses were used to teach logistics at undergraduate level, the respondent students completed questionnaires before and after the logistics training. Grant wanted to determine students' expectations of the training and the subsequent outcome. Grant's method of conducting the training in block format, as opposed to semester courses, arose from prior positive effects he found with companies in both the public and private sector domains. Grant used the block format since generally, anything longer in duration will prove to be inconvenient to most full-time or part-time employees. Grant found that previous respondents' view on training is that they can afford a week's vacation to go on a training course, hence his use of the block format (Grant, 2001:583). The importance of the study by Grant was that a logistics course can be taught successfully in one week, which is what most SCM employees would be able to attend. HR training should therefore take

note of the delivery mechanisms to be used in conducting logistics and SCM training for busy employees.

Gowen III and Tallon, surveyed 358 large American service and production organisations in 2003 to see whether HR practices could influence the SCM level of success. In particular the HR practice of training employees was scrutinised, together with barriers to implementation and efforts by both managers and employees to work towards competitive advantage (Gowen III & Tallon, 2003: 32). The authors quote the 1987 best practice study by Ernst and Whinney, who, in agreement with the Logistics Council believe that HR and training should be seen as part of business strategy instead of as discretionary budgetary considerations. They noted that best practice in SCM necessitates the training and re-training of staff, especially in times of when environmental changes are taking place (Gowen III & Tallon, 2003: 34). Gowen III and Tallon also highlight that the best practice of so-called world-class organisations placed strong emphasis on employee education, training and participation (2003: 35). They investigated Fortune 1000 companies in respect of five SCM practices and found the best types of training to be:

- For the practice of supplier quality evaluation = team building skills are required.
- For supplier partnerships = seek problem-solving skills correlation.
- In evaluating customer satisfaction = leadership skills required.
- For benchmarking of competitors = job skills are important.
- For continuous improvement teamwork = team building skills are necessary.

They conclude that it will take total commitment to HRM for firms to excel in SCM in the future (Gowen III & Tallon, 2003: 35). The limitations of the Gowen III and Tallon study, arise from the fact that it was exploratory and used only one respondent per organisation. It notes that the results are not to be generalised to all SCM practices in future (Gowen III & Tallon, 2003: 41).

In contrast to the Gowen III and Tallon study, a 2004 study by Myers, Griffith, Daugherty and Lusch questioned what the industry should do to contribute to

HR competence in logistics, which forms a subcomponent of SCM (2004: 211). Myers, *et al.,* sought to determine whether education, job specific skills and experience would impact managers' performance. Lastly they wanted to know if high performance managers are more valued by employers and are therefore rewarded more financially as well. The Myers, *et al.,* research question is illustrated in Figure 4.3 (Myers, *et al.,* 2004:211).

Figure 4.3. An illustration of the research question by Myers, Griffith, Daugherty and Lusch (2004: 213).
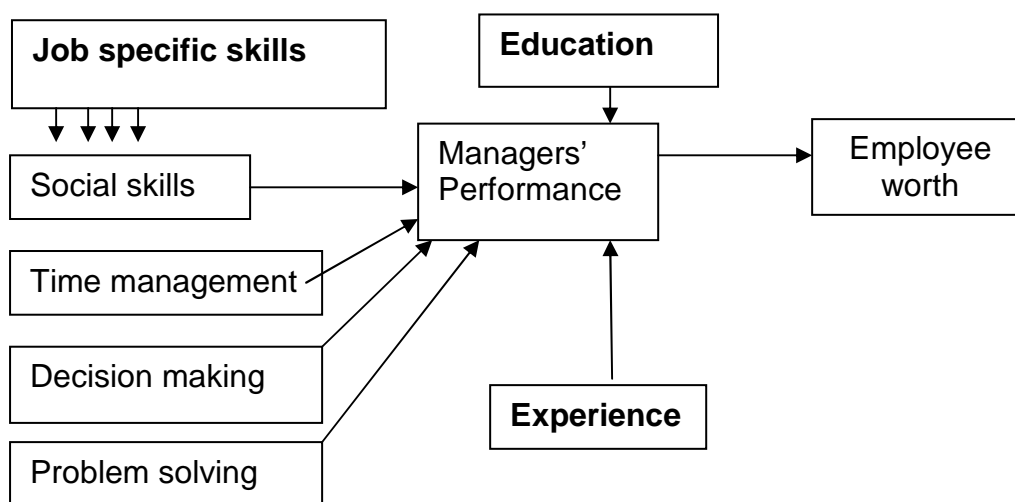
Source: Adapted from Myers, *et al.,* (2004: 213)

Myers, *et al.,* focused on entry-level and mid-level logistics managers for their study (2004: 212). They considered these managers as handling the most responsibilities yet they work without being supervised by higher-level managers. The survey instrument was however completed by their supervisors, who were higher-level managers. The questionnaire asked the higher-level managers to evaluate their mid-entry or entry-level staff about differences in education, experience and specified skills that could help or hinder the subordinates' job success. As a result of sending 1000 higher-level managers the questionnaire about their mid-entry or entry-level employees, 157 usable surveys returned. Since the average age of respondents was about 42, they were gauged knowledgeable to comment on employee

education, social skills, decision-making skills, problem solving skills and the potential impact on their subordinate's performance.

The results from the Myers, *et al.,* hypothesized study on experience, education and skills development yielded the following:

▪ Neither job experience nor educational levels are directly related to employee performance. However, specific job skills provided a better prediction of what the employee (sub-ordinate) would be worth to the employer, since they could make up what the employee lacked in terms of formal education (Myers, *et al.*, 2004:224).

▪ The methodology may need to be altered for future studies. By requesting information from higher-level management about lower ranking managers, researchers may find that results differ from one population to another. This is recommended by Myers, *et al.*, (2004:224). Based on this recommendation, this research study was adapted to questioning management level respondents about their employees in general. This study went one step further by contrasting managers' views with employee perceptions.

▪ The Myers, *et al.*, survey could not comprehensively measure problem solving or time management skills through the methodology used. Yet employees should realise that these skills, including those of decision making and social skills, will influence the managers' perceived value of their employees. Based on this management perception, they may advise the employees' organisation to find training means to improve these particular skills (Myers, *et al.*, 2004:225). .

The study by Myers, *et al.* (2004:225) yielded many more questions to be investigated. The make-or-buy decision featured in terms of training employees internally to the desired levels or hiring new employees with the necessary skills from the start (Myers, *et al.*, 2004:225). If employers decide to "buy", how do they assess potential employees' skills? If employers decide to "make" how do they determine the best types of training required? The authors recommend that multiple disciplines such as HR, operations management and even marketing collectively determine how to identify

employee skills. Their conclusion supports the multidisciplinary approach to the current South African study. While the Myers 2004 study focused on HR practices in sourcing SCM skills and talent, the next study by Othman and Ghani, looks outside of the organisation to determine HR practices.

The level of association or linkages between organisations and their supplier organisations will determine the type of HR practices they adopt (Othman & Ghani, 2008: 259). By investigating the relationships of seven Malaysian companies with their suppliers, Othman and Ghani found that three levels of linkages existed between them (2008: 206). Business can have low, moderate or high linkages between customer and supplier. When customers do not audit their suppliers, low linkage exists. When HR and processes are being audited, moderate linkage exists. When technical assistance is offered to the supplier after they have been audited, high linkage exists. The authors found that extensive training in job related and other multiple skills occurs only with high linkage (Othman & Ghani, 2008: 261). By adding job rotation practices to the training, suppliers and their customers become more flexible in dealing with future challenges and opportunities in skills development (Othman & Ghani, 2008: 262).

In the Keller and Ozment article, Daugherty (2000: 72) is quoted: her 2000 research shows that logistics senior management struggle to recruit, develop and hold on to quality logistics staff (Keller & Ozment, 2009: 378). In all countries, calls for fair opportunities were heard since the disabled, minority groups or female employees seemed to be unfairly treated in the job market. If organisations could employ more of the latter mentioned staff, they would be perceived as a more diverse organisation. The matter of an increasingly older workforce was also raised at the start of the new millennium (Keller & Ozment, 2009: 378).

In their research methodology, Keller and Ozment reviewed articles from as early as 1961 but ended in 1990s. Besides the following journals:
- Journal of Business Logistics (JBL)
- Transport Journal (TJ)

- International Journal of Logistics Management (IJLM)

- International Journal of (IJPDLM) and Transportation Research: Part E (TRE), they also utilised the ABI/INFORM, ProQuest and Google Scholar searches to find more recent articles.

Keywords used included "logistics personnel, HR, employee recruitment, diversity, transportation and distribution". The managerial skills identified by Keller and Ozment were as follows, listed in alphabetical order:

- basic business knowledge such as economics, marketing, statistics and industrial management

- basic logistics skills

- basic managerial skills

- decision making skills

- diversity awareness, management and sensitivity

- extroversion and conscientiousness

- fast problem solving

- focus/ willingness to change

- problem solving

- quantitative / technical/ information system skills

- SCM core skills

- social/communication skills

- time management

The summary of management skills found in Keller & Ozment (2009: 392) is the reason why respondents are asked about training they received in the previous 12 months preceding the empirical study. This was called hypothesis one:

$H1_0$:	There is no significant difference in the training received by managers and employees in the preceding 12 months
$H1_A$:	There is a significant difference in the training received by managers and employees in the preceding 12 months

Rao and others found in the 1990s that using both qualitative and quantitative course material may help students with problem solving skills, decision
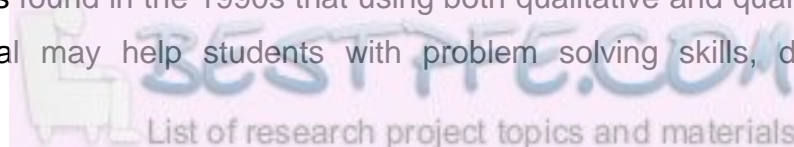
making skills and understanding logistics' effect on strategy (cited in Keller & Ozment, 2009: 381). For students, lectures, course readings and case study analyses were used in the knowledge transfer process. This format of training became a reason to investigate hypothesis two:

$H2_0$:	There is no significant difference in the format of training preferred by managers as compared to employees.
$H2_A$:	There is a significant difference in the format of training preferred by managers as compared to employees.

Keller and Ozment also reported on a case where employers agreed that seven skills were important to look for in potential employees in an attempt to attract the students into logistics careers. These include: being able to write and communicate verbally, to prioritize issues, to visualise the complete picture and to work in a team. These decision-making and problem-solving skills were also valued by hiring organisations as well as by students themselves (Keller & Ozment, 2009: 382). Keller & Ozment show that managers and students/ new employees would disagree on the type of skills required. Skills that are being disagreed on by managers and students are those of computer usage, statistics and project management skills. Students expect latest technology training from potential employers while employers in turn expect more ethical awareness from student recruits.

Research relating to skills for entry level managers was generally agreed as being knowledge of economics, industrial management, statistics and marketing since they were immediately useful to managers (Keller & Ozment, 2009: 384). When moving to skills required for mid-level managers, the following were considered important: time management skills, interpersonal and leadership skills. This is meant to build on the existing basis of problem solving and decision-making skills. Of these skills, Daugherty found only decision-making skills to be statistically significant and positively related to employee compensation (Keller & Ozment, 2009: 381). Different studies concur that top managers need to be extroverted and mid-level managers

should be conscientious. These personality traits would serve managers well in the logistics environment (Keller & Ozment, 2009: 385).

In the same way that the *career patterns of women in logistics* research study considered gender, age, formal education and job experience, the skills noted above all form part of what distinguishes managers and employees from each other. However the need for skills development and training can be neatly summed up by what the council for supply chain management professionals (CSCMP) suggested. The CSCMP suggested a minimum process standard for developing and training employees (CSCMP, 2010: 52). Their newly released 2010 e-book states that "train the trainer" is the preferred mode of teaching. They note that the focus should be on training and support of first-level managers and that training programs must exist by function/role. Nothing more has been said about the training-the-trainer initiative at either the start or conclusion of this empirical research.

4.4.   SOUTH AFRICAN SCM TRAINING NEEDS

Most of the literature reviewed so far, relates to studies conducted beyond South Africa (SA). This section highlights the contrast between recent SCM research studies and identifies possible training gaps that continue to exist in the South African context.

In sharp contrast to the United States, the Republic of South Africa (RSA) currently has a minority of SCM staff with degrees and is not concerned about the content of Melnyk & Sandor's Master of Business Administration (MBA) degree alone. The tertiary level courses being offered include SCM related courses such as procurement, transport management, warehousing, freight forwarding, port management, inventory control, imports and exports. In my own view, even if qualified SCM staff exist in SA, they can also be enticed through incentives to work in supply chains abroad. Since none of the qualified SA staff can be convinced to remain in S.A. on the strength of "building capacity to meet local skills demand alone", skills migration is a reality for investigation.

This South African research study respondents belong to mainly private sector SCM associations. It is therefore not directly comparable to the Grant study since he used non-salaried students instead of industry practitioners. Also, Grant's intervention was longer (at least one week) than the South African survey of employee respondents will be (48hours).

The Fifth Annual State of Logistics survey conducted in 2008 by the Council for Scientific and Industrial Research (CSIR) and Imperial Logistics was done after South Africa shed 500 000 jobs following the 2008 global recession. The 2009 CSIR report stated that many engineers, machine operators, technicians and drivers have low skills levels. Although it was reported in 2009 that employment demand increased in the transport sector, the problem was that the supply of employees did not.

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The aforementioned studies on SCM, HR and skills development, led to the following hypothesis:

$H5_0$ There is no relationship between existing educational qualifications and urgency for employee training

$H5_A$:   There is a relationship between existing educational qualifications and urgency for employee training

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Since the preceding literature appears to highlight the challenge of skills supply in hard cold reality terms, the future of SCM research outside of South Africa is touched on in the following section.

4.5. FUTURE SCM RESEARCH TRENDS

Although the preceding synopsis comments in retrospect on a few secondary SCM research sources, there are some recommendations for future research directions, made by authors who themselves are well known outside of South Africa. This section deals with the select few recommendations made for SCM research in the years between 2007 and 2010 and added impetus to implementing this current research study.

Over a number of years, the definitions of SCM appear to have polarised into two main sections. The first section sees SCM as a functional integrator and

the second section defines SCM as a process manager (Rossetti & Dooley, 2010: 40). Whether supply chains are focusing on continuous replenishment, being lean, agile or flexible, they are more about managing extended networks than being simple chain structures (Gattorna, 2010:11). For any type of supply chain structure, the people comprising it are still a vital component.

One year earlier in 2009, the editors of the Journal of Supply Chain Management emphasized the need to include triadic relationships in the research field, moving away from dyadic relationships. This is seen as necessary to highlight the networked phenomenon of organisations in SC structures, moving away from the links in a chain type of scenarios (Carter & Ellram, 2009: 6). Those familiar with the old way of testing research hypotheses could in future also consider using confidence intervals as opposed to absolute statistical values when hypothesizing relationships (Carter & Ellram, 2009: 6).

Melnyck and Sandor, who were discussed earlier under the demand for HR, criticised existing formal education structures. They believe educational structures have some responsibility to produce managers for global business requirements. Melnyck and Sandor (2008: 6) contend that an appropriate body of knowledge must be developed – one that identifies the critical skills that a strategic SC manager needs.

In the same way that the SCM industry is evolving and updating itself, even research journals need a revamp. This is according to the editors of the Journal of SCM, which is the oldest journal on SCM, published since 1965. Of the 27 supply journals that were evaluated by Zsidis in 2007, the JSCM was ranked number 3 out of 27 (Carter, Ellram & Kaufmann, 2008: 5). In future the journal wants to include empirical work in the areas of transaction cost economies, marketing channels, strategic management, negotiations, operations and even social networks. Their aim is to incorporate the different theories such as management theory, economics and psychology (Carter, *et al.*, 2008:6), inside and outside SCM, as long as authors continue to assess

validity. Core topics in SCM and isolated disciplines' topics should also be relevant. Current trends in the South African research arena include green and sustainable supply chains, amongst others.

4.7. CONCLUSION

This chapter looked at the definition of supply chain management by tracing its origins and evolution. Previous research identified an inherent orientation or management philosophy behind SCM, which must work together with all the processes involved. Both academics' and industry's search for the SCM definition made us conclude that SCM is defined as a network of business partners interdependent on strategically related activities and processes to serve customer needs, for the purposes of this research study.

There appears to be a continuous demand for SCM talent in view of the changing global markets. Which makes the challenges of unmet skills in SCM a reality worth investigating through this empirical research study. It is important to acknowledge women when it comes to skills development in SCM if we are to address future skills gaps. This applies to meeting both the global and the South African SCM training needs.

Regardless of the steps taken to correctly define SCM or to communicate research results effectively to practitioners, there remains the urgent call to bridge the research-practice gap. Managers want to know what they can do with the research findings (Dess & Markoczy, 2008: 58), which are reported in chapter seven. This emphasises the need, once again, for this particular research project to be relevant in both practical and literary contexts. The next chapter will explain the research methodology and approach to the supply chain training needs analysis (SC-TNA) study, with the aim of their being both relevant and useful as driving forces.

CHAPTER FIVE   RESEARCH METHODOLOGY

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5.7.1. Data capture and data editing

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5.1. INTRODUCTION

This chapter explains the research method and design applied in the training needs analysis of South African SC managers and employees. The research problem is revisited, followed by the research objectives and design of the actual study. Furthermore the research sample and population are explained in more detail. The sampling process which resulted in the empirical data collection between July 2011 and October 2011 is set out. The research survey utilised three questionnaires named Training Needs Analysis One, Two and Three (TNA1, TNA2 and TNA3). The questionnaires were compiled after investigating previous types of research studies.

E-mailing TNA1 to respondents, during phase one, started the data collection. The respondents typed their answers in a user-friendly electronic format and returned it via e-mail. Phase two data collection was done by manual completion of TNA2. Phase two took place on business organisations' premises. The reasons for using TNA 2 again as TNA3, during phase two are also clarified in this chapter. The survey questionnaires' design phase is also clarified, which pre-empts the discussion on validity and reliability from both a quantitative and qualitative literature perspective.

The data analysis tools and techniques are highlighted and contextualised in this chapter. This chapter puts the foundation in place to defend the research contribution of this study to the academic community as well as clarifying potential for practical industrial use.

5.2. RESEARCH PROBLEM

The research problem is to measure whether gaps exist between the training needs as perceived by SC managers and training needs as perceived by lower level, non-managerial staff. In the training context, a need is defined as a gap between a current situation and a future situation. This means there appears to be a discrepancy between "what is" (which is the present state) and "what should be", (representing the desired state) according to Witkin & Altschuld (1995: 4).

The statistical aim of the study is to test nine hypotheses proposing variables that may affect the supply chain training need perceptions in industry. The purpose of the study is to conduct TNA in the context of the South African business environment in order to identify and examine potential SCM training gaps. Although the research motivation have been discussed in preceding chapters, the key variables that reinforce the basis for the research aim and purpose are clarified in the questionnaire design section.

5.3. RESEARCH OBJECTIVES AND HYPOTHESES

With reference to the macro-environment described for SC personnel, the research questions are derived.

The primary research question is:

Which gaps exist and why do they exist between the perceptions of training needs held by management and employees within the supply chain management (SCM) environment?

The secondary question is:

5.3.1. Which variables influence the perceptions of training needs held by South African SCM managers and employees respectively?

The constructs under investigation include the types of training, which refer to computer software training, contract management, financial management, negotiation skills, new product training, occupational health and safety, people skills, stress management, supervisory skills, time management, transport, distribution and warehousing skills. The research constructs also included existing educational qualifications, gender, the respondents' career stages, the duration of their current job tenure, signing a contract before training considerations, a list of demotivating elements and a list of motivating elements.

5.3.2. Which variables influence the perceptions of employees contrasted against the perceptions of managers? I need to explain why I wanted to investigate this aspect. The constructs under investigation will be the

same as stated above, which include the types of training, existing educational qualifications, gender, the respondents' career stages, the duration of their current job tenure, signing a contract before training considerations, a list of de-motivating elements and a list of motivating elements**.**

5.3.3. How does the training content on previous courses that respondents have already attended differ from what they perceive to be future training content requirements? It is important to note that these sections were open-ended questions. The answers were reported only to their respective business organisations and are confidential. This was a requirement that the researcher had to adhere to, in return for having access to employee groups in the second phase of the research project.

RESEARCH OBJECTIVES

The research questions are translated into the following nine research objectives, namely to:

- determine whether there is a difference between managers' and employees' types of training that were attended in the 12 months prior to the study.

- determine which format of training is preferred by respondents

- determine the extent to which identified reasons motivate employees to attend training

- determine the extent to which identified reasons demotivate employees from attending training

- assess whether existing educational qualifications have any relationship with respondents' demand urgency for training

- test the perception whether females are offered more training opportunities than males

- determine if late-career-stage employees (older than 45 years of age) are less likely to request training than earlier career entrants

- establish the relationship, if any, between current job tenure (i.e. the duration with the same organisation) and the willingness to attend training
- ascertain whether employers' insistence that employees sign a contract will deter them from requesting more training

Judging from the literature review and the aforementioned research questions and objectives, the research hypotheses (denoted H1 to H9) are:

$H1_0$: There is no significant difference in the training received by managers and employees in the preceding 12 months

$H1_A$: There is a significant difference in the training received by managers and employees in the preceding 12 months

$H2_0$: There is no significant difference in the formats of training preferred by managers as compared to employees.

$H2_A$: There is a significant difference in the formats of training preferred by managers as compared to employees.

$H3_0$: There is no significant difference in reasons motivating employees to attend training

$H3_A$: There is a significant difference in reasons motivating employees to attend training

$H4_0$: There is no significant difference between reasons demotivating employees and managers from attending training

$H4_A$ There is a significant difference between reasons demotivating employees and managers from attending training

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H5$_0$ There is no relationship between existing educational qualifications and urgency for employee training

H5$_A$: There is a relationship between existing educational qualifications and urgency for employee training

H6$_0$: There is no gender-based difference in the perception that female employees receive more training than males

H6$_A$: There is a gender-based difference in the perception that female employees receive more training than males

H7$_0$: There is no difference in the frequency of training requests between late-career-stage employees (older than 45 years) and others

H7$_A$: There is a difference in the frequency of training requests between late career stage employees (older than 45 years) and others

H8$_0$: There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

H8$_A$: There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits

H9$_0$: Employees are not likely to request more training when employers insist on a repayment contract

H9$_A$: Employees are likely to request more training when employers insist on a repayment contract

Hypotheses that indicate relationships or correlation amongst variables do not assume any cause-and-effect relationship (Leedy & Ormrod, 2005:267). Explanatory or causal hypotheses, imply that an independent variable can "make happen" a dependent variable (Cooper & Schindler, 2003: 51). When causal hypotheses are interpreted they must be considered with regard to the

direction of the influence as well. A research hypothesis stems from the identified research problem, but is different from a statistical inference hypothesis (Leedy & Ormrod, 2005: 270). A good hypothesis is adequate for the task at hand, testable and better than its rivals (Cooper & Schindler, 2003: 53). In order to test the nine hypotheses statistically against the empirical evidence collected, the research design is illuminated next.

5.4. RESEARCH DESIGN

Business research is classified into two major categories or strategies, namely quantitative and qualitative research (Bryman & Bell, 2011: 26, Saunders, Lewis & Thornhill, 2007: 472). For this research study, both types of data are collected, although the qualitative, open-ended questions were included in the same predominantly quantitative questionnaire. The research instruments contain both quantitative, numeric data and non-numeric, qualitative descriptors (Saunders, *et al.,* 2007: 145). Although the research strategy collects both numeric and non-numeric data, it uses the mono-method approach by using questionnaires as the only research instrument. According to Bryman and Bell (2011: 27), the selected research strategy would be considered quantitative with a deductive orientation that allows preceding theory from reviewed literature to be tested.

In Table 5.1. five different types of research design are briefly explained to reinforce why the decision was made for this study to be a quantitative, deductive study, which is also considered cross-sectional and comparative.

Table 5.1. Research design types and characteristics

Type of research design	Characteristics of the research design type
1. Experimental design	This design is borrowed from natural science laboratories where conditions are controllable and variables are easily manipulated. In contrast the SCM TNA business research study took place in real life where the researcher cannot manipulate business conditions. Thus the research cannot be classified as experimental.
2. Cross-sectional design	This design involves the collection of data at a single point in time, with more than one case and multiple variables. This study is cross-sectional since it involved many businesses, at one point in time and could possibly detect variation between multiple variables. The survey method is employed to obtain various responses quickly.
3. Longitudinal design	This involves surveying samples of respondents over time in order to map changes in behaviour or processes. This design is rarely used in business due to the sample consistency required to prove causal influences over time.
4. Case study design	Involves detailed and intensive study of particular cases or businesses. This limits research to a specific organisation, location, person or event. Time constraints prevented spending extensive research time with each of the businesses that constitute the SCM environment.
5. Comparative design	This design uses the logic of comparison between situations or scenarios to derive meaning from the comparison. Reasons for similarities and/or differences across training cultures or between training cultures can be a useful way of gaining insight into the SCM TNA environments. This research study is therefore also considered a comparative research design.

Source: Adapted from Bell & Bryman (2011: 45-60), Cooper & Schindler (2003: 149).

The conclusion of the design types recorded in Table 5.1, is to designate the research project as cross-sectional in duration since time and financial resource constraints prevent a longitudinal study from being conducted. The study is also comparative since the intention is to find descriptive and explanatory answers for the discrepancy in perceived training needs.

The ethical considerations of research design, apply to any type of research design and morally guide the research content, the means of gaining access; the collection, processing and storage of data (Saunders, *et al.,* 2007: 178). Ethics compel the appropriate practices of acknowledging quoted authors and avoiding plagiarism (Mouton, 2005: 241). The ethical foundation of the research project had to be approved by an ethical research committee at the university. The committee members examined the ethical and non-discriminatory nature of the study. Research participants require assurance of the right to remain anonymous and to have confidentiality about their answers to the questions asked. The informed consent approach of the questionnaires was also approved before being distributed to the respondent sample. This consent was coupled with the right to refuse to participate in the research study. The sampling and data collection processes are clarified in the following section.

5.5.   THE SAMPLING PROCESS

5.5.1. The sampling process and sampling error

The sampling of a population of respondents is necessary when the entire population consists of too many people and businesses to survey practically within a limited time frame (Bryman & Bell, 2011:176, Saunders, *et al.*, 2007: 206). A sample is a subset of the entire population but should be large enough to derive information from the data collected. Budget constraints restrict the number of respondents that may be included in the sample, but a non-negotiable time deadline also plays its part (Bryman & Bell, 2011:170, Saunders, *et al.,* 2007: 206). Excluding time and cost, other reasons for taking a sample instead of using a census of the population, include confidentiality and accuracy (Diamantopoulos & Schlegelmilch, 2002:11).

Four factors actually influence the term 'sampling error' as asserted by Bryman and Bell (2011: 194). Firstly, the inaccurate sampling frame and non-response result in errors during the sampling process. Secondly data collection could be flawed through wording errors. Data processing could thirdly introduce faults when coding answers. Finally the sampling error exists inherently due to the fact that no selected sample could truly represent the population from whence it comes (Bryman & Bell, 2011: 194).

The sampling process as applied by Diamantopoulos & Schlegelmilch (2002: 18-19) includes the following steps.

- Define the population.
- Specify the sampling frame.
- Determine the sample size.
- Select the sampling method.
- Draw the sample and collect the data.

These steps in the sampling process were used as the demarcation of the following paragraphs.

5.5.2. Sample population definition

The population units for this study consist of individuals employed in organisations that have a verifiable supply chain structure that allows them to produce goods and services. The Phase One respondents were found in the following industry types: agriculture, mining, manufacturing, automotive industry, food and beverage; health, education, forestry, transport, retail, services and government. The Phase Two employees included fast moving consumer goods and service concerns. Although according to the internationally accepted Standard Industrial Classification (SIC) scheme there are 17 main sections of economic activity (Bryman & Bell, 2011: 182), some sections were not relevant in the local SC context. Coding rules have therefore been applied and are explained under the data preparation and research analysis section.

The units of analysis are both managers and non-managerial employees representing organisations in the South African supply chain marketplace. The levels of management included executives, middle management and supervisory-, first level management. No distinction is made between whether respondents were full-time or part-time employees and therefore contract workers were also given a chance to participate.

5.5.3. Sampling frame

The types of organisations that were sought to take part in the research study, especially for Phase 2, had to be sizable and employ more than 50 employees. This requirement improved the chance of respondent organisations having a Workplace Skills Development Plan for their employees. This means that small, medium and micro enterprises (SMMEs) would not form part of the targeted respondents if they have less than 50 employees. Major organisations selected were also able to identify their business partners upstream and downstream, thus qualifying them as part of a legitimate functional supply chain structure.

5.5.4. Sample size

The sample size has to take into account the degree of variability in the population, that is the more heterogeneous the population, the larger the sample size needed to capture the diversity in the population (Diamantopoulos & Schlegelmilch, 2002:16). The law of large numbers for the sample size, makes it more likely that the mean of the sample is equal or close to the mean of the population (Saunders, *et al.*, 2007: 211, Leedy & Ormrod, 2005: 269). The sampling strategy aims for the research sample to be representative, especially if survey findings should be generalized to the population (Bryman & Bell, 2011: 176). Representative generalizable samples are in turn linked to the research ideal of minimising the sampling error discussed earlier.

Not all researchers agree with Saunders*, et al.*, about sample size determination. According to Cooper and Schindler (2010: 408) the level of

precision that the researcher is looking for, will influence the sample size decision (denoted by *n*). Sampling size is inversely related to sampling error according to Diamantopoulos & Schlegelmilch (2002:16). For this study, although it is not possible to judge which estimate is the true mean, the researcher is willing to take a 5% risk that the sample selected does not represent the true mean of the population. That means there is a 5% loss in precision.

To illustrate the determination of sample size by using the concept of precision, for example, a survey question used a 5-point Likert Agree/Disagree scale to determine the perceptions of managers and employees about training needs. In Table 5.2, the Likert scale example is used to calculate the approximate required sample size at the 5% risk level. This calculation of the sample size was done when the TNA1 questionnaire responses were slow and stood at only 60. This was done to double check that the sample size alone would not be the main cause of error in the data processing stage of the research.

Table 5. 2. Example of sample size determination follows**…**

Table 5. 2. Explanation of sample size determination

The law of large numbers require a sample size to be at least 30 respondents in order to allow statistical tests to be done.

This study found 15 respondents in the event of PRE-TESTING the questionnaire.

Since the 95% confidence level: this means (15/30)*100

and 5% margin of error (this also means for my sample 15/30 times 100)

were the acceptable foundations of the research analysis, the minimum required sample should have been:

n = (15/30 x 100) X (15/30 x 100) x (0.154)   [where 0.154 is the test statistic]

minimum sample size (n) = 50 X 50 X 0.154

minimum sample size (n) = 2500 X 0.154

minimum sample size (n) = 385

Since the textbook world is not always found the ADJUSTED minimum sample size would have been: [Assume the population reachable via e-mail numbered 3000 respondents]. SINCE the supply chain organisations distributed TNA1 themselves, I cannot verify the exact numbers of membership.

N (adjusted) minimum sample size = 385 / (1+385/3000)

= 385/1.012833333

= 341 adjusted minimum sample size

Since there were 123 respondents, it means:

The response rate = 123/341 *100= 36% of the adjusted minimum sample size

But 123/3000 *100 = only a 4.1% response rate for the assumed population size of 3000 e-mail (TNA1) respondents.

The response rate would be miniscule if one takes into account all the employed people (millions!) who could have participated in the research study from the TNA2 perspective.

Source: Adapted from Cooper & Schindler (2011:165) together with Leedy & Ormrod (2005: 263).

From the calculation of sample size determination in Table 5.2, the researcher was reassured to continue the research process due to the small number of respondents required over and above the 5% level of making an error. The next section will elaborate on the sampling method of the sampling process.

5.5.5. Sampling method

The literature distinguishes strongly between sampling that is done according to probability sampling or that is done via non-probability techniques. The former does not guarantee that the sample selected will be more representative, only that sampling error can be statistically determined (Bryman & Bell, 2011: 717, Saunders, *et al.,* 2007: 207, Diamantopoulos & Schlegelmilch, 2002:13). Probability sampling means that each respondent had a known chance of being selected, while non-probability sampling infers that some population units are more likely to be selected (Bryman & Bell, 2011:176, Saunders, *et al.,* 2007: 207). Table 5.3 briefly explains why this research study applied non-probability, purposive, judgmental sampling technique.

Table 5.3. Advantages and disadvantages of the non-probability sampling method used

Non-probability sampling description	Advantage	Disadvantage
Purposive judgment sampling: Sample conforms to certain criteria for a given purpose. Researcher selects respondents based on particular objective.	This method can save costs and is useful to find specific themes amongst the heterogeneous population.	Has a low likelihood of being truly representative.

Sources: Adapted from Bryman & Bell (2011: 179-196), Cooper & Schindler (2003: 199), Saunders, *et al.,* (2007: 207-234), Diamantopoulos & Schlegelmilch (2002:14-16).

In addition to the disadvantages of using certain sampling techniques there are some more obvious reasons to consider. Since the researcher did not have access to the entire population for TNA1, (i.e. all people employed in a

supply chain member organisation) the use of simple random sampling was ruled out. This meant any other probability sampling technique was not feasible. Cluster sampling would relate to clusters and not individual members. Individual respondents are required when measuring employee training needs perceptions (Bryman & Bell, 2011: 223).

The purposive, judgemental sampling technique was chosen since it would allow the research questions to be answered and its objectives to be realized (Saunders, *et al.,* 2007: 230). The value of using the purposive sampling strategy (for TNA1) is that heterogeneous, maximum variability data could potentially explain the training needs gaps amongst SC respondents. Recall that supply chains consists of suppliers, warehouses, manufacturers, distributors and large customers and are therefore very heterogeneous. For TNA2, the critical case sampling meant choosing 'important' organisations to participate since their 'training problems' could also highlight training issues in other organisations (Saunders, *et al.,* 2007: 232). On finalising the reasons for using the non-probability sampling technique, the data collection had to be done.

5.6. THE DATA COLLECTION PROCESS

5.6.1 Questionnaire design

Three questionnaires were designed after consolidating the literature reviewed in preceding chapters and taking into account the local context. Training needs analysis 1 (TNA1) was used for management only while TNA2 and TNA3 focused on employees "before and after" the supply chain "awareness" intervention. TNA1 contained 60 distinctive variables and was divided into three main sections as follows:

TNA1 Section 1: Background information

This TNA 1 section included questions about managers' job titles, work areas, organisational business level, industrial sector, gender, age, number of employees, tenure of employment and number of employees reporting to them.
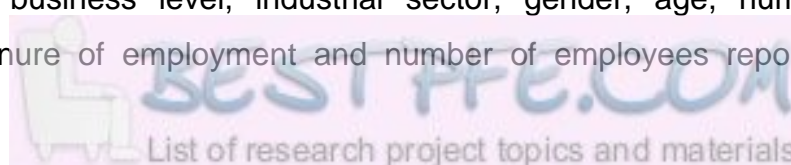
TNA1 Section 2: Education and training (about themselves)

This section included questions about their personal levels of qualification, training received in the 12 months' prior to the survey; and perceptions about previous and future training.

TNA1 Section 3: Education and training (about their staff)

This section questioned the types of training they preferred for their staff, whether they agreed with demotivating and motivating reasons for their staff to attend training, future training, budgets, frequency of training for their staff and themselves.

The TNA2 and TNA 3 questionnaires contained only 52 variables since some of the variables from TNA1 were not applicable to them. TNA 2 and TNA3 were used amongst non-supervisory employees and were divided into 3 sections as follows:

TNA2 & TNA3 Section 1: Background information

This TNA 1 section included questions in sequence about employees' job titles, tenure of employment, gender, age and their personal levels of qualification.

TNA2 & TNA3 Section 2: Views about their own training

This section included questions about reasons motivating and demotivating them to attend training and their preferred format of training. The answers to these questions could therefore be easily tested against the views of managers about employee training.

TNA2 & TNA3 Section 3: Views about their organisations

This section questioned staff views about training in general, the training they think their bosses needed, the training they needed for themselves, and the format of past training they received in the previous 12 months and future needs.

The variables were linked to the hypotheses as summarised in Table 5.4 below. Note that only the data that linked up with specific hypotheses were

reported and analysed statistically in this research project's findings. Any remaining variables, such as open-ended questions about future training wished for; will be reported in subsequent literature such as academic research articles. Some open ended questions may well have been supported by the research intervention performed by the researcher.

5.6.2. Research Intervention

The research intervention that was delivered to the TNA2 groups, were designed to allow them the same content as "food for thought" in their 48 hour reflection period. The intervention took the form of Powerpoint slides which were presented to the respondents in their training rooms/boardrooms. NB: the content of the slides were based on the example from business practice that managers use to prevent non-managerial employees from taking holiday/ paid leave. The approach followed was more artistic than scientific since the author's creative licence experience of teaching adults came into effect. The slides contained the following content:

1. Heading: Introduction to supply chain training needs

2. This slide demonstrates that respondents could have used 20 different product in the time period from waking up in the morning, to getting to the office and having their first meeting.

3. The employees could be daydreaming about being on holiday at the coast or in the Drakensberg area, both of which are tourism services in the supply chain industry.

4. The reasons for bosses to refuse employees often involve that "no one else has the skills to do your job…"

5. Employees could very well get upset with the excuses…an irate picture was shown.

6. A diagram is shown, to allow employees to identify where they fit into their supply chain structures.

7. The bosses requests are listed: that employees should work harder to "improve customer service, help suppliers to become green, train staff on Six Sigma and so forth.

8. The bosses again remind staff about supply networks and the "big picture".

9. The employees wish they could become the boss and are left to ponder: "what training do I need in order to be promoted to a more self-determining level?"

For the sake of brevity, only research objectives, not hypotheses, are listed in Table 5.4. Note that variables that were directly used in tests of comparison, association or other hypothesis testing have been placed next to each other in Table 5.4. This will expedite the explanation of the findings in chapter six. Variables that may not appear in Table 5.4 include those linked to questions about the respondents' background and demographics.

Table 5.4. Link between research objectives and variables

Research Objective	Management TNA 1 variables	Employees TNA 2 and TNA3 variables	Scale of the data
1. To determine which training was attended in the 12 months prior to the survey.	V12-V23	V40-V51	Nominal: Dichotomous
2. To determine which format of training is preferred by respondents	VV33-40	V17-V24	Ordinal, Likert scale with 3 options
3. To determine the extent to which identified reasons motivate employees to attend training	V53-V57	V7-V11	Ordinal, Likert scale with 5 options
4. To determine the extent to which identified reasons demotivate employees from attending training	V41-V52 V41 V42 V48 V45	V12-V16 V12 V13 V14 V16	Ordinal, Likert scale with 5 options
5. To assess whether existing educational qualifications have any relationship to respondent's demand urgency for training	No corresponding question	V6 = qualifications and V25	Nominal/ Dichotomous and Ordinal. Likert scale 5 options
6. To test the perception whether females are offered more training	No corresponding	V4 = gender and V26	Nominal/ Dichotomous

opportunities than males	question		and Ordinal. Likert scale with 5 options
7. To determine if late-career-stage employees (older than 45 years of age) request less training than earlier career entrants	V7 = age Contrasting question at V50	V5 = age And V27	Ratio and Ordinal. Likert scale with 5 options
8. To establish the relationship, if any, between current job tenure (i.e. >10 years with the same organisation) and the willingness to attend training	V9 = tenure but no corresponding question	V3 = tenure and V28	Ratio and Ordinal Likert scale with 5 options
9. To ascertain if employers' insistence that employees sign a contract will deter them from requesting more training	V51	V29	Ordinal Likert scale with 5 options

Source: Author's own compilation

Table 5.4 sets the tone for hypothesis testing that can involve testing for specific population characteristics, contrasts or associations (Diamantopoulos & Schlegelmilch, 2002: 135). Specific descriptive and statistical tests were selected based on which groups of respondents are analysed i.e. TNA1 management group or TNA 2 and 3 groups (employees "before" and "after"). In chapter five only those statistical tests that were actually applied in the data analyses are explained. Note that the Table 5.4 variables are also inconclusive since other variables not listed above were used to test the reliability and validity of their respective questionnaires.

5.6.3. Data collection steps

The first phase of the research study targeted management levels through their membership of professional associations and industry structures. The reason for selecting the relevant associations is that they represented the main industrial and functional areas within SCM. Those functional areas include procurement, warehousing and transport for example. During Phase 1 of data collection, the TNA1 questionnaires were electronically distributed

(via e-mail) to the professional associations in the SC realm. For purposes of unbiased selection of the sample, the researcher did not have access to the membership databases of the professional bodies. Instead, to further encourage the equal chance of participation, the relevant associations sent the questionnaire to everyone on their databases. The participating SC professional associations included:

- the Chartered Institute of Purchasing and Supply Southern Africa (CIPS)
- the Chartered Institute of Logistics and Transportation Southern Africa (CILTSA)
- the Association for Operations Management of Southern Africa (SAPICS)
- Commerce Edge (Pty) Ltd, a procurement solutions company

Due to the fact that the SC associations' distribution of TNA1 yielded an insufficient number of responses (about 65), the project was at risk of having insufficient data to analyze. Traditional common research practice advocates resending the same questionnaire as a follow-up if the response is not as desired, to serve as a reminder (Cooper & Schindler, 2003:342). However the risk of alienating the industry from participating in Phase 2 of the project required the researcher to find an alternative distribution mechanism. Contrary to the practice of re-sending the questionnaire, the researcher used the annual procurement conference hosted by Commerce Edge (Pty) Ltd as a means of faster data collection for TNA1. The questionnaires were completed manually (i.e. answers were not typed) but allowed participants to remain anonymous. The same letter of informed consent was attached to each questionnaire as applied to the e-mailed version, to allow for voluntary participation. Distributing the questionnaire both electronically and at the procurement conference, meant that a total of 123 TNA1 questionnaires were completed in four months.

Initially the researcher was planning to ask the respondents to TNA1, to volunteer their business organizations for Phase 2 of the study. Research supervisors advised against this since it might have been interpreted as

coercive. The sample for Phase 2 of the research study was therefore selected by requesting assistance from a network of business and personal contacts. These individuals are all employed in supply chain organizations. Organisations were initially approached telephonically. Immediately thereafter, an e-mail letter of request was sent to the relevant person's e-mail address. The TNA2 sample grew with permission being granted by respondent business organizations. These business organisations assembled between 10 and 30 employees respectively to take part in the study. The participating businesses sites/premises were visited twice during the same week, with a 48-hour rest/reflection period between sessions. Managers communicated the time and place (i.e. boardroom or training rooms) to their staff members even if the research request was not originally addressed to the particular managers by name.

The five participating organisations included business partners from fast moving consumer goods (FMCG) organisations as well as a service related logistics organisation. These organisations were visited twice within the same week for data collection to maintain consistent treatment of all respondents. The number of non-participant organisations that were approached via e-mail requests, telephonically or via personal referrals was eleven. Of the 11 approached, only three politely declined the TNA2 request directly. The rest (eight) silently communicated their inability to participate by their non-response to the TNA2 request. The completed questionnaires (both TNA2 and TNA3) numbered 110 and these were collected between August and October 2011. Due to their festive season business preparations, companies were not likely to participate in research studies beyond October in any given year.

5.6.4. Pre-testing of the questionnaire

Both questionnaires were pre-tested before distribution to the field. The management level TNA1 questionnaire was pre-tested amongst five managers in the supply chain field. Their completion times were recorded to double-check that the questionnaire was not too long. No complaints were

received regarding question ambiguity or lack of clarity. Questions were answered completely as requested in the cover letter/consent page.

TNA2 was pre-tested in a continuous education class that was coincidently and conveniently held on campus. Fifteen respondents completed the questionnaire in less than 30 minutes. The SC pitch intervention was delivered after collecting the completed instrument. The respondent class was given free rein to comment on the content and format of the SC pitch before being given 48 hours to reflect on their training needs. After 48 hours within the same week, the TNA3 questionnaire was administered to the same group of respondents. On both occasions the questionnaires were completed in full and no complaints were received about the contents. On the contrary, respondents welcomed the opportunity to provide their views on their own managers' training needs.

Since the questionnaires appeared to fit the requirements of the research objectives, they were administered in field as soon as the university's ethical committee had cleared their contents and approach.

5.6.5. Data collection and questionnaire reliability and validity

The goal of validity is to question whether we are really measuring what we think we are measuring. Reliability asks whether the results from our measures are consistent, according to Diamantopoulos and Schlegelmilch (2002:32). Research design credibility will be judged on whether an existing research instrument has been previously used (and validated) or not. Since TNA1, TNA2 and TNA3 were newly constructed by using many literature sources, the criteria that assess credibility namely reliability, replication and validity became applicable to testing the questionnaire as well as the overall design (Bryman & Bell, 2011:41, Mouton, 2005: 100, Statsoft, 2003). Although these criteria apply to predominantly quantitative data, qualitative responses have to comply with the element of trustworthiness. Table 5.5. highlights the aspects of reliability and validity to show similarities between quantitative and qualitative data collection strategies. Table 5.5. also lists four

subsections to describe trustworthiness under the qualitative research section below.

Table 5.5.   The research design and questionnaire credibility criteria

Criterion & threats	Quantitative research	Qualitative research
Reliability:	Reliability checks whether the results will stay consistent on different research projects and be transparent enough to repeat the measurement (Saunders, *et al.,* 2007: 149).	Dependability, is similar to external reliability and questions whether the findings are likely to apply at other times, outside of the study (Bryman & Bell, 2011: 43). Confirmability parallels the objectivity of the researcher, which means that his/her values should not influence the research process (Bryman & Bell, 2011: 43).
Validity	Validity is concerned with how well the research concept is defined by the measure(s) and whether the findings are reflections of reality (Saunders, *et al.,* 2007: 150)	Credibility which is similar to "internal validity" that determines whether the findings are believable (Bryman & Bell, 2011: 43). Transferability parallels the concept of external validity and questions whether findings will be applicable in other contexts (Bryman & Bell, 2011: 43).

Source: Adapted from Bryman & Bell (2011: 43), Saunders, *et al.,* (2007: 150)

The need to test questionnaires' validity and reliability stems from the existence of research errors. There are two types of measurement error: systematic error (or Bias) and random error (also called Variable Error). Bias occurs in a consistent manner every time a measurement is taken, for instance a general tendency to respond negatively, while random error can occur in any direction. When a measure is free of both systematic error (S) and random error (R), then it becomes a measure of its validity. In other words a perfectly valid measure implies that the observed score (O) is equal to the true score (T). Measurement error means that: Observed score (0) =

True Score (T) + Measurement Error (E) according to Diamantopoulos and Schlegelmilch (2002: 32):

However, reliability can be under threat from participant error/bias or from observer error/bias (Saunders, *et al.,* 2007: 150). Reliability means that a measure is free from random error and implies that random error (R) = 0 (zero). Note that if a measure is not reliable, it cannot be valid (Diamantopoulos and Schlegelmilch, 2002: 34). However, if a measure is reliable, it may/may not be valid. In other words, a measure that is valid is reliable, but not necessarily the other way around.

Reliable research instruments should deliver consistent results (Cooper & Schindler (2003: 236). Bryman and Bell explain three different meanings of reliability that assess the consistency of the measuring instrument used in the research project (Bryman & Bell, 2011:157). The first one of stability involves a test-retest scenario where an instrument is administered to the same group over a short time to determine if any variation occurs. Their second interpretation of reliability checks for internal reliability to see if a respondent's scores on any indicator are related to their scores on other indicators (Bryman & Bell, 2011: 158). The third interpretation of reliability is called inter-observer consistency and is not commonly used (Bryman & Bell, 2011: 158).

Cronbach's Alpha is a commonly used test of internal reliability. It calculates the average of all possible split-half reliability coefficients. A score of 1 on the computed Cronbach-Alpha coefficient means a perfect internal reliability and a score of 0 implies no internal reliability (Bryman & Bell, 2011: 159). The rule of thumb suggests that a score of 0.7 is enough to denote an acceptable level of internal reliability (Bryman & Bell, 2011: 159). Hair, Anderson, Tatham and Black (1998: 88) suggest that a Cronbach-Alpha value of between 0.6 and 0.7 can be considered the lower limit of acceptability.

Chapter six findings are based on ways of minimising the risks of inconsistent or not valid questionnaires. Construct validity was not tested through factor analysis (Cooper & Schindler, 2003: 232). Since the questionnaires were

newly constructed for the purposes of the research study, due to the comparative nature of the analysis statistical tests were done to look for underlying patterns or common variance amongst variables (Cooper & Schindler, 2003: 613, Diamantopoulos & Schlegelmilch, 2002: 216).

Since the research design did not lend itself to factor analyses, corresponding questions were asked in different sections of the questionnaires in order to verify that the respondents understood the questions and interpreted them correctly. The data analysis procedure therefore follows next in order to explain the ways of increasing the validity and reliability of the questionnaires.

5.7. DATA ANALYSIS PROCEDURE

This section briefly explains the data analysis procedure upon completion of the data collection stage.

5.7.1. Data capture and data editing

Phase 1 Data:

After completing the electronic questionnaire that was scheduled to be less than half an hour long, the management level of participants returned it to the researcher via e-mail. The researcher's e-mail address was written in the cover letter (Refer to the appendices to see a copy of the cover letter). The completed questionnaires were printed out individually to allow manual encoding by the researcher. For the manual completion of TNA1 at the Commerce Edge (Pty) Ltd. conference, the hard copy completed questionnaires were coded in the same way as those returned via e-mail.

Phase 2 Data:

The researcher travelled with manual copies of the TNA2 questionnaire that were completed manually by participating supply chain organisations' employees. An electronic slide presentation was shown to respondents on a big screen at the organisations' training facilities/boardrooms in order to show respondents simultaneously what SCM is about. After 48 hours the researcher returned to the organisations' facilities where the respondents assembled again to complete the TNA3 questionnaire manually.

164
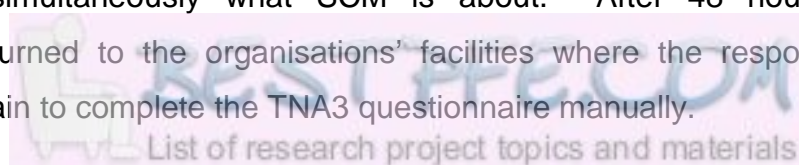
The data collection period took about four months to complete (July-October 2011). A typist assisted with the data collected from TNA1, TNA2 and TNA3 to capture the data after coding into three separate electronic (computerised) databases. Unanswered questions were not coded (i.e. they were left blank) since some binomial questions already used 1 or zero to indicate affirmative or negative answers. Open-ended questions were typed into an Excel spreadsheet with respondent numbers as the unique identifiers. These were reserved mainly to clarify any unusual results obtained from the quantitative data analyses. The Statistical Analysis Software (SAS) system for data analysis was used since the program is licensed for use by the Statistical Department of the university.

5.7.2. Data analysis focus

The rationale for the data analysis process included a descriptive focus, a comparative focus and a hypothesis testing focus. The latter two use inferential statistics to see if the sample data can inform us about the SCM TNA population (Leedy & Ormrod, 2005: 267).

▪ **Descriptive data analysis**

The data set can be described according to its measures of central tendency, variation and correlation (Leddy & Ormrod, 2005: 257). Variations are found per variable where scores differ from the mean aptly named standard deviations. Since central tendency and variations only check individual variables, correlation looks at whether a relationship exists between two or more variables (Leedy & Ormrod, 2005: 257). Correlation can indicate direction and strength of the relationship between two or more variables. Direction is recorded as either perfectly positive or perfectly negative (i.e. +1 and −1) while the strength of the relationship is shown by the closeness of the measured statistic to 1 (Leedy & Ormrod, 2005: 265).

According to Saunders, *et al.,* (2007: 423) individual variables can also be summarised to consider their trends over time, proportions and distributions.

By applying descriptive analysis, the descriptive frequency tables also allowed the individual data distributions to be checked for major discrepancies or proportions of missing data. In this way, compiling the frequency tables enabled the categorisation of continuous data into acceptable ranges. Measures of central tendency in the data set distributions include the mode (which occurs the most frequently), the median/numerical center and the mean/fulcrum point of the data (Leedy & Ormrod, 2005: 258). The mean was used mostly in testing hypotheses in the research project. By keeping management data (TNA1) separate from employees' "before" (TNA2) and "after" (TNA3) data, it was easier to distinguish between questions that were fully answered or not.

▪ **Comparative data analysis**

The authors Diamantopoulos and Schlegelmilch see the statistical test options for making comparisons between groups as illustrated in Figure 5.1. below. Statistical tests are selected based on the level of measurement being either nominal, ordinal, interval or ratio types of data.

During the comparisons between data sets, the contingency tables were easily assembled since the variables could be verified from coding tables completed during the data capture phase. The two-sample tests of homogeneity or tests of independence were done to establish whether the management group displayed characteristics similar to the employee group on certain variables (Diamantopoulos & Schlegelmilch, 2002: 180).

The data sets were compared in the following settings:

Managers (TNA1) were compared to employees "before the intervention" (TNA2).

Managers (TNA1) were compared to employees "after the intervention" (TNA2)

Employees were compared with each other before and after the intervention (i.e. TNA2 was compared to TNA3).

Figure 5.1.   Making comparisons using different statistical techniques
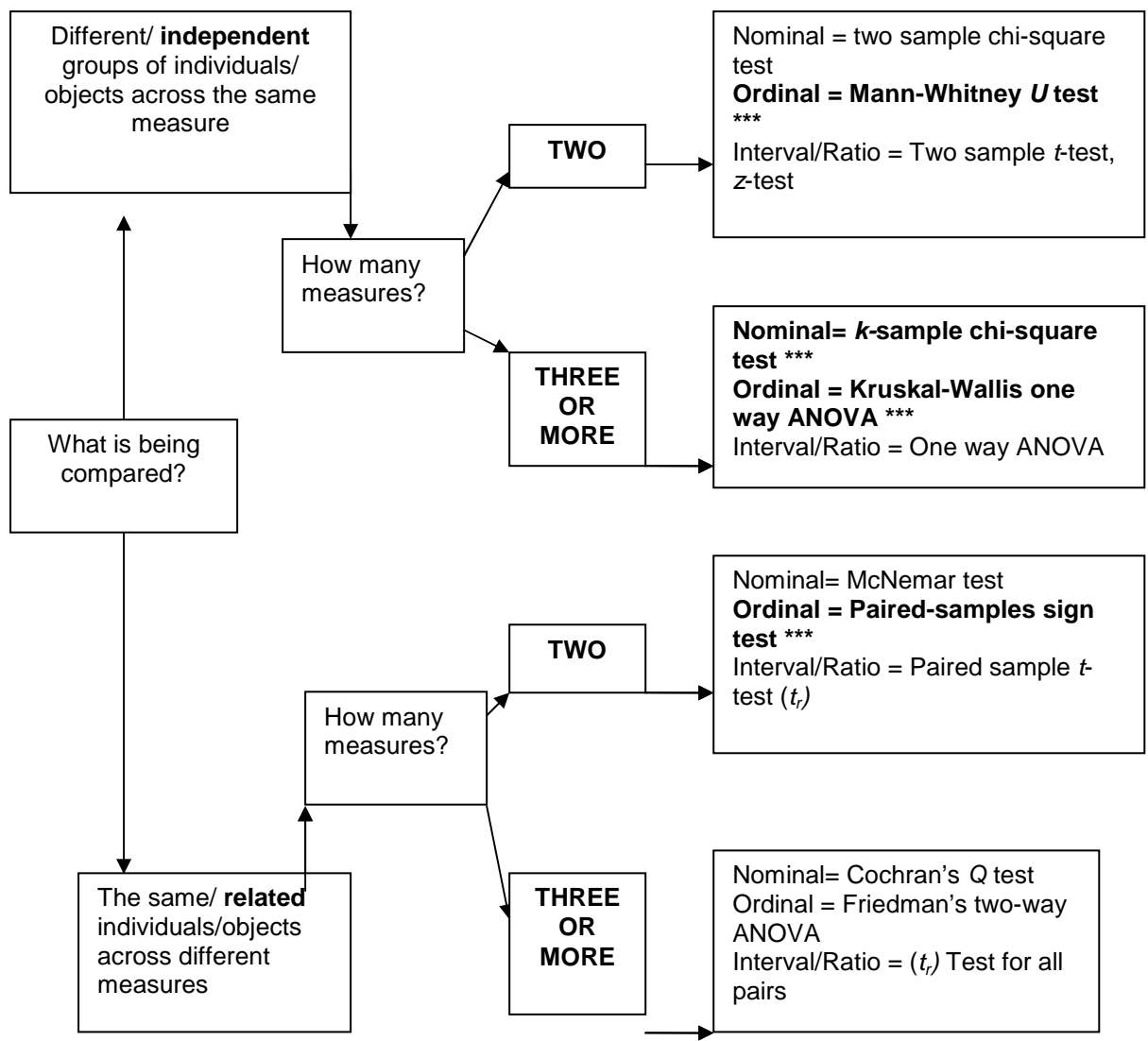
Source: Adapted from Diamantopoulos & Schlegelmilch (2002:174).

Recall that in Figure 5.1 the statistical tests with asterisks *** are all non-parametric. This concept of non-parametric tests is explained in Table 5.6.

Table 5.6.   Explanations of the non-parametric inferential statistics

Goal	Purpose of inferential statistical procedure	Interpretation of the test statistic
1. To test whether two groups are different	Chi-square only if variables are grouped into discrete sections: tests whether categorical data variables are associated (Saunders, *et al.*, 2007:593). Since the sample sizes were too small when comparing two variables, the Fisher Exact Test was used to determine the relationship, instead of the Chi-square test. (Diamantopoulos & Schlegelmilch, 2002:178)	The *p*-value indicates the probability or chance that the data could occur by chance alone. Thus a *p*-value =/< than 0.05 means there is only a 5% possibility of the data occurring by chance alone. Or, stated in another way, it means we can be 95% sure that the relationship between the two variables is not due to some random act.
2. To test whether two paired groups are different	A paired *t*-test is used, which can also be used to test for changes over time. The test involves using the same group and different pairs of variables for continuous or discrete data. For our research purposes the Simple Kappa Statistic (SKS) was used.	Simple Kappa Statistics are interpreted as follows: Values < 0.4 = weak reliability Values between 0.4 and 0.75 = fair reliability Values > 0.75 = significant reliability
3. To test whether three or more groups are different	The Kruskal-Wallis test for ordinal data is used to compare three or more group means. The parametric equivalent of this test would be the Analysis of Variance (ANOVA): to test the likelihood that groups' data variables differ due to chance alone	When the p-value is less than the Alpha value (e.g. α < 0.05), the result is statistically significant. We decide to reject the null hypothesis since the results cannot be due to chance alone. Thus the probability is small that there is no relationship between the variables. When the p-value is more than the Alpha value (e.g. α > 0.05), the result is not statistically significant. We cannot reject the null hypothesis since the probability is larger that there may/may not be any relationship between the variables.

| 4. To assess the strength of relationship between two variables | Spearman's rank correlation coefficient (Spearman's rho) or Kendall's rank correlation coefficient (Kendall's tau) for ranked data. The parametric equivalent would be Pearson's product moment correlation coefficient (PMCC) to test the strength of the relationship | |

Source: Adapted from Saunders, *et al.*, (2007: 442-444 and 591-614) and Leedy & Ormrod (2005: 274) and Diamantopoulos & Schlegelmilch, (2002: 178).

5.7.3. Shortcomings and sources of error

Referring to hypotheses testing Cooper and Schindler (2003: 524) state that we reject a Null Hypothesis (H_o) when finding a statistically significant difference and therefore accept the Alternative Hypothesis (H_A). When a Type I error is committed, it means a true H_o is rejected (Leedy & Ormrod, 2005: 272, Cooper & Schindler, 2003: 525). The alpha value ($\propto$) is called the level of significance and is expressed at 5% for most main purposes of the research analysis. The $\propto$ is the probability of rejecting the true H_o. This means that the probability of making a correct decision not to reject H_o if H_o is true; will equal 95%. With a Type 2 error, (β= which is pronounced Beta), the researcher can fail to reject a false H_o.

Some of the data sets were not well represented when compiling contingency tables during the comparative phase of data analyses. For this reason the Chi-square (λ^2) tests were not always appropriate for all comparisons and issued warnings. For example, when using a contingency table where the degrees of freedom (d.f.) equal 1, the expected frequency should be at least 5 in size. When degrees of freedom are more than one, less than 20% of the expected frequencies should be smaller than 5, for the λ^2 test to be used. The λ^2 test prefers expected frequencies not to be less than 1. As a result, the

decision was made to exclude the λ^2 results in favour of using the Fisher Rank test for all discussions and findings.

This phenomenon of having to substitute the Chi-square test with the Fisher Rank test occurred when multivariate comparisons took place for example measuring two groups, splitting them into gender groupings and splitting the response types into a Likert scale as well. Thus there were too many options to allow large enough respondents on particular questions, which made the frequencies sometimes <5.

5.8.   CONCLUSION

This chapter reintroduced the research problem, objectives and hypotheses as first stated in chapter one. It explained the research design as being a cross-sectional comparative study within the South African SCM context. The sampling process was explained, highlighting the involvement of SCM industry associations and the employees of participating organisations in the empirical collection of data. The data collection process involved two phases since the first questionnaire (TNA1) was distributed via e-mail and in phase 2, the second and third questionnaires (TNA2 and TNA3) were administered on site. Respondent questionnaires were checked for completeness and coded manually, preceding their data capture for processing using the SAS system. In conclusion, the results of the descriptive, comparative and inferential data analyses will be discussed in the next chapter.

CHAPTER SIX   RESEARCH FINDINGS

6.1.   INTRODUCTION

6.2.   DESCRIPTIVE STATISTICAL FINDINGS

6.3.   HYPOTHESES AND INFERENTIAL STATISTICAL FINDINGS

6.4.   SUMMARY OF FINDINGS IN TRAINING NEEDS

6.5.   CONCLUSION

6.1. INTRODUCTION

This chapter presents the research findings of the empirical training needs analysis conducted between July and October 2011. The respondents are divided into two major groups i.e. managers and employees. The group of employees is further sub-divided into their responses *before* the supply chain management "awareness" intervention and *after* the event. Managers' questionnaires were returned electronically during Phase 1 while employees' questionnaires were completed manually in Phase 2 at the premises of their business organisations. The abbreviations used to distinguish between groups are as follows:

- For managers: Training Needs Analysis 1 is called TNA1
- For employees, before the SCM pitch: Training Needs Analysis 2 (TNA2)
- For employees, after the SCM pitch: Training Needs Analysis 3 (TNA3)

The chapter starts with descriptive and demographic information about the two main groups of respondents, i.e. managers and employees. The discussion is structured such that management feedback is reported first, followed immediately by employees' findings. The major differences discovered about supply chain training needs displayed by respondents were encapsulated in the hypotheses testing. The hypotheses' statements and findings from various statistical tests are presented. The previous chapter explained the basis for the validity and reliability of the research instrument whose results are presented here. In conclusion the chapter will capture and highlight the main findings that are discussed in the final chapter.

6.2. DESCRIPTIVE STATISTICAL FINDINGS

This section describes the respondents' gender, job title, industry description, age, organisations' number of employees, length of employment and number of direct reports to the managers. The findings of the employees versus their managers' responses are similar except that the employees were not asked about the size of their organisations, in case they did not know the answers.

Since TNA2 and TNA3 targeted employees at non-supervisory levels, they were also not asked about the number of staff members reporting directly to them. The findings of the managers are reported first.

6.2.1. DEMOGRAPHIC FINDINGS –MANAGERS

There were 123 management level respondents of which 70% are male and 30% are female. The senior management level of respondents at 35.83% only marginally outnumbered the middle managers, which stood at 35%. The third highest level of managerial hierarchy claimed is at the operational level with 17.17% of the total respondents. This spread amongst levels of managers indicates that using the professional associations to distribute the questionnaire electronically yielded a response from diverse but relevant decision makers in SCM. The distribution via e-mail decision in Phase 1 has also been justified by another phenomenon. The phenomenon is that the largest classification of work functions came from respondents who are involved with all SC functions (33.61%). This classification includes those in Procurement (20.49%) and Logistics/Transport at 10.66%. Altogether almost two thirds of the managerial respondents are actually involved in the main supply chain functions currently. This bodes well for the quality and authenticity of their responses. The managers' business levels are illustrated in Figure 6.1.

Figure 6.1. The business level at which managers' function in their organisations
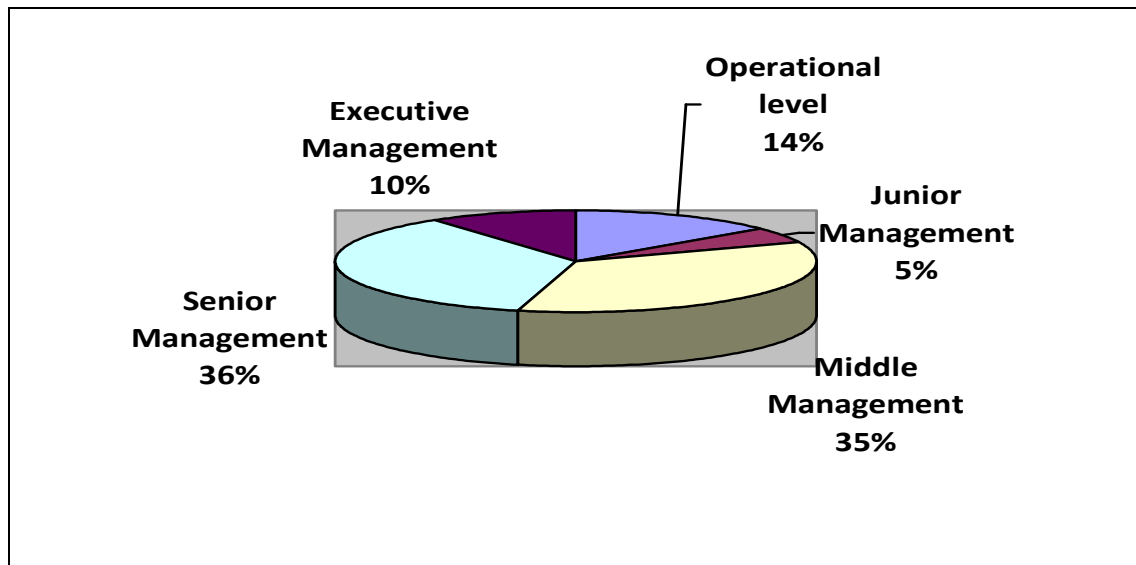
Source: Author's own compilation based on empirical data

From the management questionnaire (TNA1), the spectrum of industries managers placed themselves in, yielded 42.86% as being from "other" industrial classifications. Twenty three percent (23.53%) were representing managers in the service industry and 19.33% of respondents were from the consumer goods/manufacturing sectors. The fact that more than 80% of the types of industries are represented in the management level group is also a reassurance that the research is not biased towards a certain polarity of participants. Note that the decimals were rounded off in Figure 6.2.

Figure 6.2. The industrial sector in which managers' placed their organisations
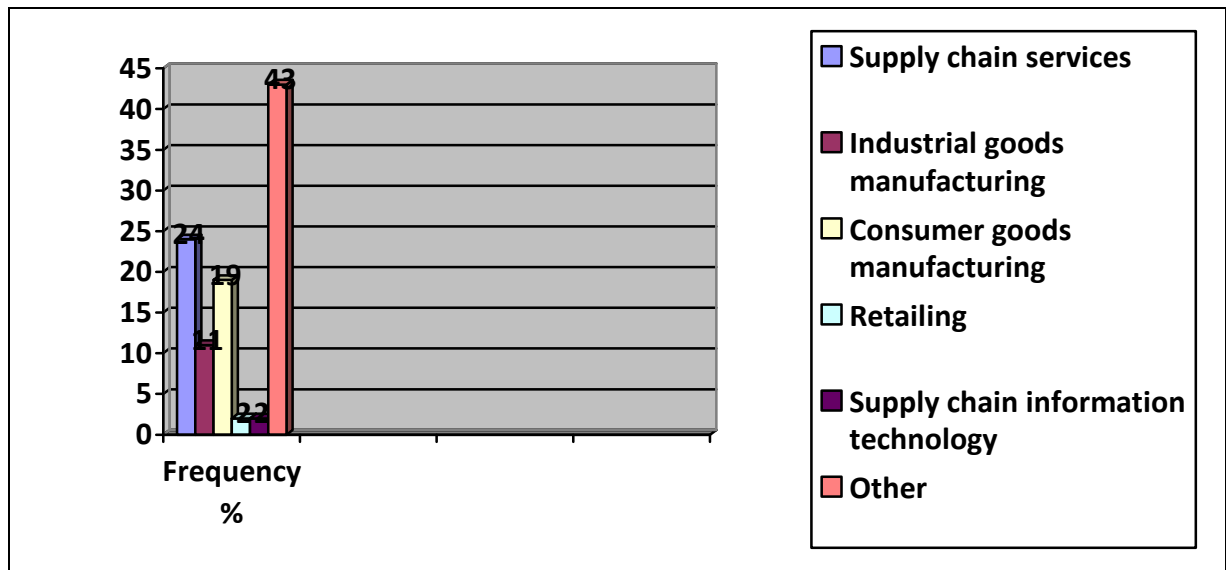
Source: Author's own compilation from research findings

The ages of the TNA1 management respondents ranged from between 21 to 70 years of age at the time of the survey in 2011. The first quartile ended between ages 33-34 years at the 29.5^{th} percentile, while the 75th percentile started at age 45 years old. This means that the bulk of the managerial respondents are between the ages of 35 and 45 years of age. Only five of the respondents failed to state their ages out of the total of 123 respondents.

The size of the organisations that these managers worked for ranged from 3 employees to 180000. Note that the range of frequencies listed in Table 6.1. below are not split up into equal parts due to large variations in organisational size.

Table 6.1.   The size of organisations according to employee numbers reported by the management group TNA1.

Organisational size according to number of employees	Actual Frequency	Cumulative Percentage
Between 3 and 500 employees	43	40.57%
Between 501 and 1000 employees	10	50.00%
Between 1001 and 1500 employees	06	55.66%
……..Between 1800 and 8000 employees	27	81.13%
……..Between 10000 and 50000 employees	19	99.06%
……..At 180000 employees	01	100.00%

The number of respondents who either "did not know" the number of employees or merely neglected to answer the question equals 17 non-respondents. Half of the respondents were from organisations with 1000 or less employees. Eighty-one percent of the respondents had less than 8000 employees. The strange incidence (call it an outlier) is that a gradual progression occurred in the growth of employee numbers, up to the 50 000 mark, thereafter only one organisation made the astronomical jump to 180 000 employees. The unknown factors about the organisations above are twofold. Firstly we do not know how many of them conduct actual training needs analyses for their staff members. The reason why the question was not put forward to the management group is that one cannot be sure that all the respondents would have known how to answer the question. Secondly we also do not know whether performance reviews conducted by or administered to the participating respondents would necessarily have resulted in any training need being identified. It is therefore important to note that the size of the organisation is not an indication of an organisation's training needs. The size of the respondents' organisations can also not indicate the type of training policies the organisation upholds.

The TNA1 respondents reported the duration (in years) they have been employed by their particular organisations. The length of employment ranged from 1 year to 37 years and the findings were as displayed in Table 6.2. which follows:

Table 6.2. **Length of employment with current organisations for managers**

Employment duration (in years) as at 2011	Actual Frequencies	Cumulative Percentage
1 - 5 years	56	47.86%
6 - 10 years	17	62.39%
11 -15 years	15	75.21%
16 - 20 years	16	88.89%
21 -25 years	09	96.58%
26 – 30 years	03	99.15%
31 – 35 years	00	99.15%
36 – 40 years	01	100.00%
Total response *(n)*	117	
Non-response *(n)*	06	

From the original data collected for Table 6.2, it appears that a quarter of the management group (16+13= 29) were employed for two years or less in the organisations from which they responded to the survey. A lesser part (8+11+8 = 27) has been there for between 3-5 years. This incidence appears a little odd considering the fact that the majority of the management group's ages ranged between 35-45 years of age. This could suggest that there are rapid inter-organisational staff movements in the South African SC context since 47% of the respondents have been employed for 5 years or less in their current organisations. This may be normal in any industrial context, but may require further delving into the South African industrial labour patterns in order to further explain the phenomena.

In terms of employees who directly report to the TNA1 respondent management group, 54% have an average of 3 direct reports. The manager with the most number of staff reporting directly to him appears to be 300. It is not clear what the organisational structure is for one manager to be responsible for such a large number of employees. The next closest large number was stated as 174 employees reporting to another manager, while

two managers reportedly have 100 employees respectively reporting to them. The employee findings are reported on, next.

6.2.2. DEMOGRAPHIC FINDINGS –EMPLOYEES

There were 110 respondents amongst the non-managerial level of which 53% are male and 47% are female. Only one respondent abstained from the question on gender. The employees are more evenly split between males and females than the TNA1 split was 70:30 in favour of males. In order to encourage respondents to participate, the question on rank/ position was omitted. The only question indicative of official employment is an open-ended question on the respondent's job title, which allowed them to describe how they are known at their places of work. The resultant titles reflected the nature of the organisation that participated in the study, but the respondents remained anonymous in their responses. Employees were also not asked to identify their organisation within the spectrum that managers were requested to do, since it was not known how many employees would actually know the answer to the question. The same principle was applied in the omission of the question regarding the organisational size. As a result the respondents were not distracted from answering the majority of the TNA2 and TNA3 questionnaires in full.

The ages of the respondents ranged from those between 19 to 60 years of age at the time of the survey in 2011. Seven of the respondents failed to state their ages out of the total of 110 respondents. The percentiles were therefore calculated on 103 respondents. The first quartile for employees ended between ages 27-28 years at the 25.75^{th} percentile, while the 75th percentile located between ages 41-42 years of age. This means that the bulk of the employee respondents are between the ages of 29 and 40 years of age. This range is noticeable different from the bulk of the manager respondents who fell between 35-45 years of age.

The employee respondents reported their duration in terms of the number of years they have been employed by their particular organisations. The

respondents' answers stated as a "number of months equalling less than a year", were coded as being one year, since they would have completed a year tenure by the time the findings are reported. The length of employment ranged from 1 year to 32 years and the findings are listed in Table 6.3 below. Six employees were non-respondents on this question.

Table 6.3. **Length of employment with current organisations for Employees**

Employment duration in years as at 2011	Actual Frequency	Cumulative Percentage
1 –5 years	56	53.85%
6 – 10 years	21	74.04%
11 –15 years	11	84.62%
16 – 20 years	05	89.42%
21 –25 years	05	94.23%
26 – 30 years	04	98.08%
31 - 35 years	02	100.00%
Total (n)	104	

From Table 6.3, it shows that the 74% of the respondents who participated in TNA2 and TNA3 have been with their organisations for 10 years or less. This 74% of respondents and 26% employed for longer than 10 years, are shown per year in the polygon below. From the original data, there is one employee each for the categories who have been with their organisations for between 22-32 years.

Figure 6.3. Employment frequencies of "less than 10 years" for Employees before the intervention (TNA2).

Figure 6.3. based on Table 6.3. data
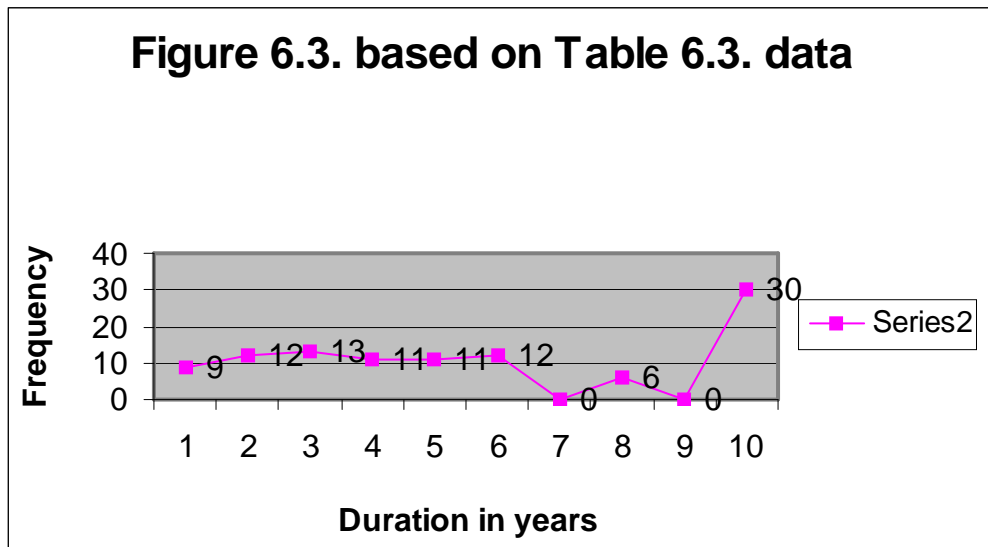
Source: Author's compilation based on empirical data

The positive implication of having the majority of the employees in their organisations for less than 10 years is that they probably can access many training opportunities during their lifetime at their respective organisations. These findings also open up areas for further research as will be highlighted in the recommendations section of the final chapter.

6.3   HYPOTHESES AND INFERENTIAL STATISTICAL FINDINGS

This section will state all nine Null and Alternative Hypotheses to be tested against the empirical evidence collected.   Hypothesis testing can involve testing for specific population characteristics, contrasts or associations (Diamantopoulos & Schlegelmilch, 2002: 135).   The three areas to test hypotheses are shown in the illustration below.

Figure 6.4. Types of hypotheses testing

```
                          ┌─────────────────────────────────────┐
                          │ Specific population characteristics =│
                       ┌──│ mean, variance, proportions.         │
                       │  └─────────────────────────────────────┘
┌──────────────┐──────┤
│ Hypothesis   │      │  ┌─────────────────────────────────────┐
│ testing      │──────┤  │ Contrasts/comparisons = bigger than  │
└──────────────┘      │  │ (>), smaller than (<), not equal to ≠│
                      │  └─────────────────────────────────────┘
                      │
                      └──┌─────────────────────────────────────┐
                         │ Associations/relationships = plus (+),│
                         │ minus (-), plus/minus (±)            │
                         └─────────────────────────────────────┘
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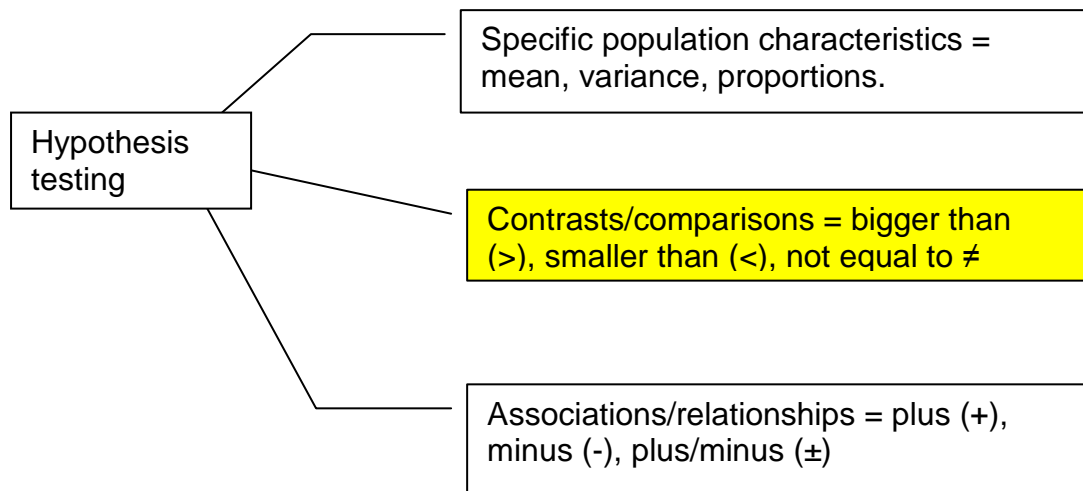
Source: Adapted from Diamantopoulos & Schlegelmilch (2002: 135)

The rest of the chapter is structured by first presenting specific population characteristics for the variables attached to a research hypothesis statement. The findings made by the visual inspection of means, standard deviations and proportions will be supported by appropriate statistical tests to determine if contrasts or relationships are significant. In this way, conclusions and recommendations will aim to refer only to the evidence presented by the data.

6.3.1. SECTION ONE: TESTS OF PROPORTION

H1$_0$: **There is no significant difference in the training received by managers and employees in the preceding 12 months**

H1$_A$: **There is a significant difference in the training received by managers and employees in the preceding 12 months**

TRAINING RECEIVED BY MANAGERS IN PRECEDING 12 MONTHS

It was important to determine whether managers have attended training in the 12 months preceding the research survey, instead of presuming that no training was taking place in industry. Managers were presented with a list of 12 courses and had to select the ones they had attended in the 12 months prior. The 12 courses were split into two categories namely technical skills and soft skills for coding purposes. The two categories were decided on the basis of "personal" manager skills or "job related" skills. Technical skills are regarded for this study, as objective matters involving 'less personal' related aspects. The technical skills grouping included training courses in software computer skills, contract management, financial management skills, new product training, occupational health and safety; transport and distribution; and warehousing skills. Soft skills training included negotiation skills, people skills, stress management, supervisory and time management skills. The category of "Both" includes where the managers have indicated that they had received both types of training. The data summary below represents a classification of Technical Skills, Soft skills and a Combination of both technical and soft skills; that the managers were sent on training for:

Table 6.4.   The training received by the managers in the 12 months preceding the survey.

Non-response	Both Technical and Soft	Technical skills	Soft skills	Total
20	42	39	22	123

From the Hypothesis 1 Table 6.4, it appears that 34% (42/123) of the management group had training in both technical and soft skills, while 16.2%

(20/123) did not respond to this question. Possible reasons for the non-response could include that they attended training in a time period outside of the preceding 12 months under question, or alternatively that they were not trained in the courses listed.

Since the list of 12 courses was not exhaustive, managers also had the option to select "other" and describe the training they attended in their own words. By referring to the "other" option, the open-ended answers yielded the following courses listed in alphabetical order for the managers:

- advanced management training
- auditing training
- environmental/sustainability training
- forecasting
- lean manufacturing
- manufacturing
- presentation skills
- project management
- supply chain management training
- waste management
- writing skills

The only training courses where the management group recorded a frequency higher than one (but less than five) included certified supply chain management training, coaching skills training, exporting/customs training and leadership training.

The value derived from the question on training received in the 12 months preceding the survey, lies in the evidence that there can be as many combinations and permutations of courses as there are managers willing to be trained. This variety bodes well for the supply chain industry. Since the management sample has attended training in the 12 months preceding the research study, others can imitate.

TRAINING RECEIVED BY EMPLOYEES IN PRECEDING 12 MONTHS

It was important to also determine whether employees attended training in the 12 months preceding the research survey, instead of presuming that no training took place. The data summary for employees in Hypothesis 1 Table 6.5. represent a classification of Technical Skills, Soft skills and a Combination of Both, exactly the same as what managers were sent on training for: Similarly to the management questionnaire, the technical skills grouping included training courses in software computer skills, contract management, financial management skills, new product training, occupational health and safety; transport and distribution; and warehousing skills. Soft skills training included negotiation skills, people skills, stress management, supervisory and time management skills. It is immediately noticeable how few employee respondents had received soft skills training in the 12 months preceding the survey (only 3 out the 110).

Table 6.5.   The training received by employees in the 12 months preceding the survey.

Non-response	Both Technical and Soft	Technical skills	Soft skills	Total
34	27	46	03	110

From Hypothesis 1 Table 6.5, it appears that only 25% (27/110) of the employee group had training in both technical and soft skills, while 31% (34/110) did not respond to this question. Potential reasons for the non-response could include that they attended training in a time period outside of the preceding 12 months under question, or that they were not trained at all.

Employees also had the option to select "other" and describe the training they attended in their own words. By referring to the "other" option, the open-ended employee answers yielded the following courses listed in alphabetical order:

- emotional intelligence
- fire fighting
- marketing

- procurement training

- sales training

- System Analysis and Program Development (SAP) supervisor

- stock training

- super user training

The only training courses where the employee group recorded a frequency higher than one (but less than five) included: asset management training, disciplinary procedures/handling, supply chain management introduction, project management and quantum lean manufacturing.

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to H….*

Hypothesis 1.1: There is no significant difference between Managers (TNA1) and Employees "before" (TNA2) for training received in preceding 12 months

Hypothesis 1.1. Table 6.6 summarises the Frequencies and Percentages of both the managers and the employees. The data shown in H1.1 Table 6.6 exclude Missing Frequencies of the 20 Managers' non-response and 34 Employees non-responses on the question of training received in the 12 months preceding the survey. The two-sample Chi-Square statistical test for nominal data resulted in a warning due to the amount of missing responses. Therefore the Fisher Exact Test was used to test for a significant result.

Table 6.6.   Contingency table between TNA1 and TNA 2 on "hard, soft and Combination of both" training skills

Group	Both Technical and Soft Skills	Soft Skills	Technical Skills	Total
TNA1 /Managers	42	22	39	103
Frequency %	40.78%	21.36%	37.86%	
TNA2 / Employees	27	03	46	76
Frequency %	35.53%	03.95%	60.53%	
Total (effective sample size)	69	25	85	179
Frequency Missing				54
Fisher's Exact Test	Pr< = P: 4.917E-04 which means that the result is less than 0.0001			

The empirical evidence shows that there is mostly technical training taking place amongst employees, which is proportionately different from the training received by managers. **The Null hypothesis H1.1$_0$ is rejected** due to Fisher's Exact test yielding a significant result less than 0.05, when testing at the 95% significance level. The fact that a more significant portion of the management group received soft skills training compared to the non-managerial level employees indicates a difference in training received in the preceding 12 months.

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to H….*

Hypothesis 1.2: There is no significant difference between Managers (TNA1) and Employees "after" (TNA3) for training received in preceding 12 months

Hypothesis 1.2. Table 6.7 summarises the Frequencies and Percentages of both the managers and the employees. H1.2. Table 6.7 excludes Missing Frequencies of the 20 Managers' non-response and 35 Employees non-responses on the question of training received in the 12 months preceding the survey. The two-sample Chi-Square statistical test for nominal data resulted in a warning due to the amount of missing responses. Therefore the Fisher Exact Test was used to test for a significant result.

Table 6.7.   Contingency table between TNA1 and TNA3 on "hard, soft and combination of both" training skills

Group	Both Technical and Soft Skills	Soft Skills	Technical Skills	Total
TNA1 /Managers	42	22	39	103
Frequency %	40.78%	21.36%	37.86%	
TNA3 / Employees	19	3	45	67
Frequency %	28.36%	4.48%	67.16%	
Total (effective sample size)	61	25	84	170
Frequency Missing				55
Fisher's Exact Test	Pr< = P: 1.900E-04 which means that the result is less than 0.0001			

Besides the attrition of nine less employee participants during the "after" session of data collection, there is also a significant difference at the 95%

level. Fisher's Exact Test yielded a result of smaller than 0.05 and confirms that the discrepancy between technical, soft skills training and the combination of both is a significant difference. **Both Hypothesis 1.1 and Hypothesis 1.2 are therefore rejected.** However, we still have to check whether employees from TNA2 and TNA3 have changed their training experience answers within the 48 hours of reflection they encountered between answering the questionnaires.

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to "H"….*

Hypothesis 1.3: There is no significant difference between "Employees Before (TNA2) and Employees After (TNA3)" in training received in preceding 12 months

Hypothesis 1.3. Table 6.8 summarises the Frequencies and Percentages of the employees before and after the supply chain awareness intervention. H1.3. Table 6.8 excludes 49 Missing Frequencies of combined data sets on the question of training received in the 12 months preceding the survey. The two-sample statistical test for nominal data with related samples is used. The Simple Kappa test, which is similar to the McNemar before and after test, was used to test for a significant result. Data are however presented in a three-way contingency table, while McNemar would have used a 2-way contingency table. The key to interpreting the Simple Kappa Statistic for dependent samples is as follows:

Values < 0.4 = weak reliability

Values between 0.4 and 0.75 = fair reliability

Values > 0.75 = significant reliability

Table 6.8. **Contingency table between TNA2 and TNA3 on "hard, soft and combination of both" training skills**

Group	Employees Before (TNA2)			
Employees After (TNA3)	Both Technical and Soft Skills	Soft Skills	Technical Skills	Total
Both Technical and Soft Skills	18	01	01	19
Frequency %	94.74%	0.00	1.61%	
Soft Skills	01	01	00	02
Frequency %	50.00%	50.00%	0.00	
Technical Skills	03	00	38	41
Frequency %	07.32%	0.00%	92.68%	
Total (effective sample size)	22	01	39	62
Frequencies Missing				49
Simple Kappa Statistic (SKS)	**Since SKS =0.8301 the result is significant, therefore reject the null hypothesis**			

The reasoning behind not using the Chi-square test for nominal data is that the employees for the two groups TNA2 and TNA3 are the same respondents. The two groups are therefore related or dependent samples. Since the SAS program was used for the data analysis (which has less functionality than SPSS), the Simple Kappa Statistic for non-parametric statistics was more useful.

Thus we can conclude the results for Hypothesis One by noting that there are training gaps in existence between Managers (TNA1) and Employees Before (TNA2); and between Managers (TNA1) and Employees After (TNA3) as it pertains to receiving "Soft skills, Technical Skills or Both" in the 12 months preceding the research project. There is also a significant difference between Employees Before (TNA2) and Employees After (TNA3) with regards to receiving "Soft skills, Technical Skills or Both" in the 12 months preceding the research project. The implications of these findings are discussed in chapter seven. The conclusion of the Hypothesis One results can be illustrated as in Figure 6.4 below:

Figure 6.5.   Conclusion of tests for Hypotheses One variables
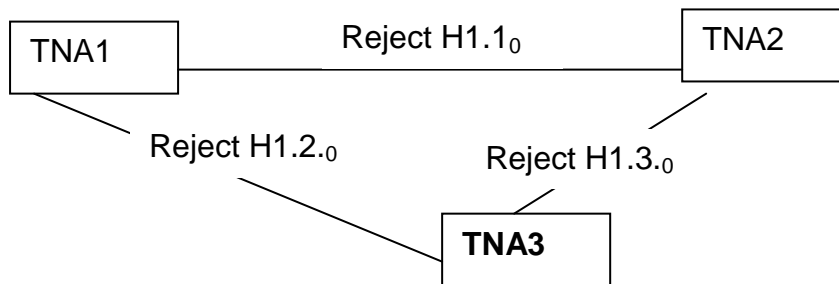
Source: Author's own compilation

INTERPRETATION OF HYPOTHESIS 1

The H_1 null hypothesis that there is no significant difference in the proportions of training received in the 12 months preceding the survey, between managers and employees was rejected. Gaps existed between TNA1-TNA2, between TNA1-TNA3 and between TNA2-TNA3. The results were obtained by using Fisher's Exact test on contingency tables for independent samples and the Simple Kappa Test for dependent samples. This hypothesis used 12 courses to determine whether all respondents (managers and employees) have undergone training in the preceding 12 months for any of the courses listed. The dichotomous nature of the answer, made it necessary to split 7 of the courses as "technical skills" and the remainder was labelled "soft skills" for ease of analysis. Since the technical skills included most functions of supply chain management, it was increasingly obvious that employees only had exposure to technical skills in the preceding 12 months. The gap that must be bridged before employees can grow and/or move into managerial type positions would thus include soft skills such as negotiation, stress management, supervisory, time management and general people skills.

Hypothesis two follows…

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to "H"….*

6.3.2. <u>SECTION TWO: TESTS OF BOTH INDEPENDENT AND DEPENDENT GROUPS ON 3+ MEASURES</u>

$H2_0$: **There is no significant difference in the opinion of managers and employees with regard to the preferred formats of training for employees**

$H2_A$: **There is a significant difference in the opinion of managers and employees with regard to the preferred formats of training for employees**

The questions targeted managers' response on the formats of training they preferred for their staff and thereafter asked employees which formats of training they preferred for themselves. The response options include "never, sometimes and always" and were arranged in a Likert scale format of never = 1, sometimes = 2 and always = 3. The variables under consideration are listed in the following sequence:

1. **On the job training**
2. **In-house training**
3. **Seminar/conference training**
4. **Short course training**
5. **Product training**
6. **Distance education**
7. **Self training**
8. **Online/web/internet courses**

Each of the eight variables will be discussed from the data collected from TNA1 (managers), TNA 2 (employees, before the intervention) and TNA 3 (after the intervention). It is important to note that the managers' responses are recorded from 123 questionnaires for TNA1, while TNA 2 had 110 respondents and TNA3 with attrition, had 102 respondent employees.

In order to understand the flow of the Hypothesis Two findings, an example is shown to demonstrate how the results are structured:

For example- for the variable "on the job training":

Hypothesis 2.1(i): The results show the comparison between Managers (TNA1) and Employees Before (TNA 2). The concluding remarks will list it as TNA1-TNA2.

Hypothesis 2.1(ii): There is no significant difference between Managers (TNA1) and Employees After (TNA3) preference for "on the job" training. The concluding remarks will list it as TNA1-TNA3.

Hypothesis 2.1(iii): There is no significant difference between Employees Before (TNA2) and Employees After (TNA3) preference for "on the job" training. The concluding remarks will list it as TNA2-TNA3.

The findings are first recorded in frequencies, followed by comparative contingency tables between sample groups, TNA1, TNA2 and TNA3. The decision to reject or accept the hypothesis is provided before the subsequent set of samples' findings are presented. All formats of training (showing the 8 variables' results) are summarised, before reporting on the findings for Hypothesis Three. Without further ado, the results for hypothesis two follow.

The first type of format for training under consideration, tests how often managers and employees want to use the format of training that is mainly "on the job".

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to "Hn.n".….*

Hypothesis 2.1(i): There is no significant difference between "Managers (TNA1) and Employees before (TNA2)" preference for "on the job" training

Table 6.9: Frequencies for the format of training "on-the-job"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	01.05	02.80	05.05
Sometimes = 2	28.42	41.12	44.44
Always = 3	70.53	56.07	50.51

The frequency responses show that the management industry norm is to prefer the format of "on-the-job" training. The descriptive statistics from Table 6.9. show that more than 70% of the management response selected "always" to indicate their preference. Employees were more split between "sometimes" and "always" for TNA 2. However more employees started saying "never" for on-the job training in the TNA 3 sessions as opposed to "always" in the TNA2 sessions.

The correlation test between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 202, with 31 frequencies missing.

Table 6.10. Correlation between TNA1 and TNA2 on the format of training "on-the-job"

Variable: On-the-job-training	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	3	44	60		1	27	67	
Percentage (%)	2.8	41.12	56.07		1.05	28.42	70.53	Pr<=0.09

Note that the H_2 Table 6.10. uses the same legend of H_2 Table 1 where 1= Never, 2 = Sometimes and 3 = Always. The probability that this difference in preference between managers and employees is due to chance alone is larger than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no statistical difference between the managers (TNA1) and employees' preferences (TNA2) for on-the-job-training, before the intervention. The decision is not to reject the null hypothesis.**

Hypothesis 2.1(ii): There is no significant difference between Managers (TNA1) and Employees After (TNA3) preference for "on the job" training
The correlation test between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 194, with 31 frequencies missing.

Table 6.11. Correlation between TNA1 and TNA3 on the format of training "on-the-job"

Variable: On-the-job-training	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	5	44	50		1	27	67	
Percentage (%)	5.05	44.44	50.51		1.05	28.42	70.53	Pr<=0.0085

The probability that this difference in preference between managers and TNA3 employees is due to chance alone is smaller than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for on-the-job-training, after the intervention. The decision is to reject the null hypothesis.**

Summarising the findings for the variable "on the job" training, the null hypotheses is not rejected for groups TNA1-TNA2 but rejected between TNA1-TNA3. This means that there are significant differences between managers and employees (TNA3) on their preference for on-the-job training. The next step is to examine the findings between TNA2-TNA3**.**

Hypothesis 2.1(iii): There is no significant difference between Employees Before (TNA2) and Employees After (TNA3) preference for "on the job" training

The correlation test between the TNA2 and TNA 3 groups of employees yields an effective sample size of 98, with 13 frequencies missing. Note that 1=never, 2=sometimes and 3=always in the following table.

Table 6.12. Simple Kappa Test between "Employees before (TNA2) and Employees after (TNA3)" with their preference for "on-the-job" training

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	01	03	01	05
2= Sometimes	02	26	15	43
3= Always	00	10	40	50
Total (effective sample size)	03	39	56	98
Frequencies Missing				13
Simple Kappa Statistic (SKS)	**Since SKS =0.4057 the result is fair. Therefore we cannot reject the null hypothesis.**			

The Simple Kappa test works on the same principle as the McNemar Before and After test. The McNemar test cannot be applied here since the data are not dichotomous in nature. The principle of testing symmetry still applies. In other words, the TNA2-TNA3 test is trying to determine if employees changed their minds after the SCM awareness intervention or not.

INTERPRETATION OF THE FINDINGS ABOUT ON-THE-JOB TRAINING

The discrepancy between TNA1-TNA2 showed similar perceptions [therefore could not reject H2.1 (i)] null hypothesis. However the employees in the comparison between TNA1-TNA3 changed their minds about "on-the-job" training preferences [therefore we could reject H2.1. (ii)]. For the paired samples of TNA2-TNA3, the employees' Simple Kappa Statistic was fair [therefore could not reject H2.1. (iii)]. It appears that the old traditional method of training staff has been heavily relied upon and accepted as common practice amongst managers. Perhaps in the year 2013, the future requires a deeper enquiry as to employee preferences for on-the-job training when they may well prefer using other alternatives.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: IN-HOUSE TRAINING

The following results pertain to the variable of the format of in-house training. Note that the frequencies recorded are for differing sample sizes where TNA1 =123, TNA2 = 110 and TNA3=102.

Hypothesis 2.2. (i): There is no significant difference between Managers (TNA1) and Employees Before (TNA2) preference for "in-house" training

Table 6.13. Frequencies for the format of training: "In-house"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	04.31	16.50	11.96
Sometimes = 2	64.52	54.37	54.35
Always = 3	31.18	29.13	33.70

The different responses between TNA1 and TNA2 show that employees are 12% less enchanted with in-house training than what managers prefer. From TNA3, more employees (about 4%) started seeing "in-house" training as an "always" option as opposed to "never".

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 195, with 38 frequencies missing.

Table 6.14. Frequencies for the correlation on format of training: "in-house training" for TNA1-TNA2

Variable: In-house training	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	17	56	30		3	60	29	
Percentage	16.50	54.37	29.13		3.26	65.22	31.52	Pr<=0.0078

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for in-house training, before the intervention.   The results for the TNA1-TNA2 comparison on the format of "in-house" training demonstrate that**

the null hypothesis should be rejected. The following sets of data refer to the TNA1-TNA3 findings.

Hypothesis 2.2 (ii): There is no significant difference between Managers (TNA1) and Employees "after" (TNA3) preference for "in-house" training

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 184, with 41 frequencies missing.

Table 6.15. Correlation on format of training: "in-house" for TNA1-TNA3

Variable: In-house training	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	11	50	31		3	60	29	
Percentage	11.96	54.35	33.70		3.26	65.22	31.52	Pr<=0.0603

The probability that this difference in preference between managers and employees is due to chance alone is more than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no statistical difference between the managers (TNA1) and employees' preferences (TNA3) for in-house training, after the intervention. We cannot reject the null hypothesis** on the "in-house" training format since the test statistic exceeds the critical value of 0.05. The subsequent set of findings stem from the TNA2-TNA3 sets of data.

Hypothesis 2.2 (iii): There is no significant difference in the proportion of "Employees before (TNA2) and Employees after (TNA3)" preference for "in-house" training

The correlation test between the TNA2 and TNA 3 groups of employees yields an effective sample size of 92, with 19 frequencies missing. Note that 1=never, 2=sometimes and 3=always in the following table.

Table 6.16. Correlation between "Employees before (TNA2) and Employees after (TNA3)" on the format of "in-house" training

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	08	03	00	11
2= Sometimes	03	38	09	50
3= Always	02	10	19	31
Total (effective sample size)	13	51	28	92
Frequencies Missing				19
Simple Kappa Statistic (SKS)	**Since SKS =0.4934 the result is fair. Therefore we cannot reject the null hypothesis.**			

INTERPRETATION OF THE FINDINGS ABOUT IN-HOUSE TRAINING

The discrepancy between TNA1-TNA2 showed different perceptions [therefore could reject $H_{2.2}$ (i)] null hypothesis. However the employees in the comparison between TNA1-TNA3 changed their minds about "in-house" training preferences [therefore could not reject $H_{2.2.}$ (ii). The cause of the changed preference is unknown. For the paired samples of TNA2-TNA3, the employees' Simple Kappa Statistic was fair [therefore could not reject $H_{2.2.}$ (iii)]. It appears that the well-known method of using in-house training is also up for review in current business practices. Perhaps a misunderstanding or misinterpretation exists between management and employees on the nature and/or value of using in-house training for staff development.

Hypothesis 2 (continued) for the variable: SEMINAR/CONFERENCE TRAINING

The next comparison is for the variable: seminar /conference training. Note that the frequencies recorded are for differing sample sizes where TNA1 =123, TNA2 = 110 and TNA3=102.

Hypothesis 2.3 (i): There is no significant difference between "Managers (TNA1) and Employees before (TNA2)" preference for "seminar/ conference" training

Table 6.17. Frequencies for the format of training: "seminar/ conference"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	12.22	09.09	14.61
Sometimes = 2	74.44	56.57	51.69
Always = 3	13.33	34.34	33.71

The difference between TNA1 and TNA 2 is that 74% of managers prefer to "sometimes" send their employees to attend seminars/conferences as part of the employee training, while 90% of employees prefer going to seminars and conferences as a method of training themselves. The difference between TNA2 and TNA3 is that about 5% of employees changed from "sometimes" to "never" in TNA3.

There were 11 non-respondents in the TNA2 study and marginally more (13)

TNA3 non-respondents after 48 hours of measurement.

The correlation between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 188, with 45 frequencies missing.

Table 6.18. **Frequencies for the format of training "seminar/ conference training"**

Variable: Seminars/ conferences	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	9	56	34		10	67	12	
Percentage	9.09	56.57	34.34		11.24	75.28	13.48	Pr<= 0.0036

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using the seminars/conferences training format, before the intervention. The decision is to reject the null hypothesis.** The following comparison is based on the TNA1-TNA3 preferences for seminar/conference training.

Hypothesis 2.3 (ii): There is no significant difference between "Managers (TNA1) and Employees after (TNA3)" preference for "seminar/ conference" training

The correlation between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 178, with 47 frequencies missing.

Table 6.19. **Frequencies for the format of training: "seminar/ conference"**

Variable: Seminars/ conferences	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	13	46	30		10	67	12	
Percentage	14.61	51.69	33.71		11.24	75.28	13.48	Pr<= 0.0023

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance

level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using the seminars/conferences training format, before the intervention. The null hypothesis can therefore be rejected.**

Table 6.20.   Simple Kappa Test between the "Employees before (TNA2) and Employees after (TNA3)" in their preference for "seminar/conference" training

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	04	07	02	13
2= Sometimes	01	37	05	43
3= Always	00	07	23	30
Total (effective sample size)	05	51	30	86
Frequencies Missing				25
Simple Kappa Statistic (SKS)	**Since SKS =0.5536 the result is fair. We therefore cannot reject the null hypothesis.**			

INTERPRETATION OF THE FINDINGS ABOUT SEMINAR/CONFERENCE TRAINING

There was no change in the TNA1-TNA2 and the TNA1-TNA3 comparisons, therefore we could reject both H2.3 (i) and H2.3 (ii) null hypotheses.   The null hypotheses stated that there were no significant differences between managers and employees on the issue of seminars/conferences as a way of training.   By rejecting both null hypotheses we can conclude that there is a significant difference in the way managers and employees have experienced seminars and conferences.   The decisions to reject the null hypotheses are indicative of face and sample validity since industrial practice may make a distinction between whether certain ranks of employees might be exposed to the same 'privileges" of using seminars and conferences as training mechanisms. Managers concentrated on using seminars and conferences only "sometimes", while both TNA2 and TNA 3 respondents were concentrated more on "sometimes" and "always.   This phenomenon strongly suggests that this form of training is something employees may want to explore but that managers may not readily assent to employees attending seminars/conferences.

**INTERPRETATION OF THE FINDINGS ABOUT SEMINAR/
CONFERENCE TRAINING (CONTINUED)**

Although this conclusion may seem premature, the Simple Kappa Statistic measured for employees alone (TNA2-TNA3) reinforce the findings. The H2.3 (iii) hypothesis stated that there was no significant difference between employees before and after the intervention. By looking at employees' responses apart from managers, the employee preference seems substantiated. The result of the Simple Kappa test was fair and the null hypothesis for H2.3 (iii) cannot be rejected. This means that employees did not change their minds about their preferences for seminars and conference even though they had a supply chain awareness intervention. Employees would sometimes/always prefer to have this option as a training mechanism whereas managers leaned more overwhelmingly only toward "sometimes"! In future, businesses may need to incorporate this form of training in a sustainable way to allow their employees some benefit from training through seminars and conferences.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: SHORT COURSES

The next variable to be compared under H2 is that of preferences for short courses.

The succeeding variable of "short course training is used to compare managers and employees' perceptions.

Hypothesis 2.4 (i): There is no significant difference between Managers (TNA1) and Employees "before" (TNA2) preference for "short-course" training

Table 6.21. Frequencies for the format of training: "short course training"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	05.00	01.90	03.19
Sometimes = 2	62.00	39.05	40.43
Always = 3	28.00	59.05	56.38

From TNA 1 we find that 62% of managers think it is only "sometimes" preferred as a means to train employees. In contrast, from TNA2 it shows that 59% of employees always prefer using short courses as a method of training themselves. Twenty-eight respondents from the management side declined to state their preferences. The difference in frequencies between TNA2 and TNA 3 was a tiny employee movement away from short courses from "always" to both "sometimes" and "never". TNA 2 had 5 non-respondents and TNA 3 had 8 non-responses.

The correlation between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 200, with 33 frequencies missing.

Table 6.22. Format of training "short course training" Fisher's Exact Test for TNA2-TNA1

Variable: Short course training	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	2	41	62		5	62	28	
Percentage	1	20.50	31.00		5.26	65.26	29.47	Pr<= 6.712E-05

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.0001 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using format of short courses, before the intervention.   The null hypothesis can thus be rejected.**

Hypothesis 2.4 (ii): There is no significant difference between "Managers (TNA1) and Employees After (TNA3)" preference for "short-course" training

The correlation between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 189, with 36 frequencies missing.

Table 6.23.   Fisher's Exact Test for TNA3-TNA1 for the format of training: "short course training"

Variable: Short course training	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	3	38	53		5	62	28	
Percentage	3.19	40.43	56.38		5.26	65.26	29.47	Pr<= 5.760E-04

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.0001 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using the format of short courses, after the intervention. Therefore the null hypothesis can also be rejected here.**

Hypothesis 2.4 (iii): There is no significant difference between "Employees before (TNA2) and Employees after (TNA3)" preference for "short course training".

Table 6.24.   Contingency table for Employees Before (TNA2) and Employees After (TNA3) preference for "short course" training

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total

1= Never	00	03	00	03
2= Sometimes	00	24	13	37
3= Always	00	11	41	52
Total (effective sample size)	00	38	54	92
Frequencies Missing				19
Simple Kappa Statistic (SKS)	**Since SKS = 0.4155 the result is fair. Therefore we cannot reject the null hypothesis**			

From the findings in Table 6.24, the employees from TNA3 appear to retain their earlier mindset from TNA2 about short courses as a preferred format of training.

INTERPRETATION OF THE FINDINGS ABOUT SHORT COURSE TRAINING

The null hypothesis for H4 stated that there is no significant difference between managers' and employees' preference for short course training. In both tests for H2.4 (i) and H2.4 (ii), the probability statistics were so miniscule that the null hypotheses could be rejected in both TNA1-TNA2 and TNA1-TNA3. The discrepancy is big since employees seem to love short courses as a training mechanism, whereas managers think they are worthwhile only "sometimes".

When comparing only the employee responses in TNA2-TNA3, the Simple Kappa Statistic is also fair. This means that the H2.4 (iii) hypothesis that there is no significant difference for employees before and after the intervention in their preference for short course training; cannot be rejected. By default, the conclusion is that employees have not changed their minds in the 48hour reflection space. Their love for using short courses as a form of training therefore appears convincing.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: PRODUCT TRAINING WITH SUPPLIERS

The next comparison is between TNA 1 and TNA2 on the basis of: product training with suppliers.

Hypothesis 2.5 (i): There is no significant difference between Managers (TNA1) and Employees Before (TNA2) preference for "product training with suppliers"

Table 6.25. Frequency comparison on the format of training "product training with suppliers"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	28.74	14.42	08.79
Sometimes = 2	57.47	33.65	43.96
Always = 3	13.79	51.92	47.25

The difference between TNA1 and TNA2 is that almost double the number of managers say "never" as opposed to the employee "never" preference. It appears that the TNA1 respondent group has a preference tending away from sending employees to suppliers for product training. Thirty-six respondents from the management side declined to state their preferences.

The difference in frequencies between TNA2 and TNA3 shows it difficult to concretely conclude on employee preferences with regards to product training with suppliers. Employees moved marginally from "never and always" to fill up the "sometimes" category.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 190, with 43 frequencies missing.

Table 6.26. Fisher's Exact Test between TNA2-TNA1 for the format of training: "product training with suppliers"

Variable: Product training with suppliers	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	15	35	54		24	50	12	
Percentage	14.42	33.65	51.92		27.91	58.14	13.95	Pr<= 1.462E-07

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.0001 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using "product training with suppliers" format, before the intervention. Therefore this null hypothesis can be rejected that stated no difference between TNA1 and TNA 2 on product training with suppliers.**

Hypothesis 2.5 (ii): There is no significant difference between Managers (TNA1) and Employees After (TNA3) preference for "product training with suppliers"

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 177, with 48 frequencies missing.

Table 6.27. Fisher's Exact Test between TNA3-TNA1 for the format of training: "product training with suppliers"

Variable: Product training with suppliers	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	8	40	43		24	50	12	
Percentage	8.79	43.96	47.25		27.91	58.14	13.95	Pr<= 1.091E-06

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.0001 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using "product training with suppliers" format, before the intervention. The decision is to reject the null hypothesis.**

Hypothesis 2.5 (iii): There is no significant difference between "Employees before (TNA2) and Employees after (TNA3) preference for "product training with suppliers"

Table 6.28. Contingency table for "Employees before (TNA2) and Employees after (TNA3) preference for "product training with suppliers"

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	07	01	00	08
2= Sometimes	03	20	17	40
3= Always	00	10	33	43
Total (effective sample size)	10	31	50	91
Frequencies Missing				20
Simple Kappa Statistic (SKS)	**Since SKS = 0.4136. The result is fair. Therefore we cannot reject the null hypothesis.**			

This concludes the hypothesis testing on the format of product training with suppliers between TNA1-TNA2, TNA1-TNA3 and TNA2-TNA3.

INTERPRETATION OF THE FINDINGS ABOUT PRODUCT TRAINING WITH SUPPLIERS

The H2.5(i) and H2.5(ii) null hypotheses that there is no significant difference between managers and employees preference for product training with supplier, can both be rejected. Managers do not prefer this method of training while employees seem to embrace it more often. There is by default, a statistically significant difference between how managers and employees view product training with suppliers.

By themselves employees also held fast to their preference and yielded a fair Simple Kappa Statistic. This means the null hypothesis that there is no significant difference in employee perceptions before and after the intervention; cannot be rejected. This means that employees held on to their convictions that product training with their suppliers, is a form of training they would always want to use/engage in.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: DISTANCE EDUCATION

The next comparison is between TNA1 and TNA 2 on who prefers distance education or not as a means of training staff members.

Hypothesis 2.6 (i): There is no significant difference between "Managers (TNA1) and Employees Before (TNA2)" preference for "distance education" training

Table 6.29. Frequencies for the format of training: "distance education where employees study after hours by themselves"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	**TNA1/ MNGT**	**TNA2 / EMP**	**TNA3 / EMP**
Never = 1	13.98	18.45	21.51
Sometimes = 2	67.74	49.51	41.94
Always = 3	18.28	32.04	36.56

The difference between TNA1 and TNA2 is that almost exactly the same percentage of managers (18%) say "always" as opposed to the employee "never" preference for this format of training. It appears that 68% of the respondent group of managers believe in distance education for their employees to use "sometimes" as training, while about 50% of employees prefer it "sometimes". It is notable that 30 respondents from the management side declined to state their preferences, while only 7 employee respondents declined to answer. The difference between TNA2 and TNA3 is a bi-directional shift away from "sometimes" to a 3% employee increase in "never" as a preference and 4% in "always" as an option.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 196, with 37 frequencies missing.

Table 6.30. Fisher's Exact Test between TNA2-TNA1 for the format of training "Distance education where employees study after-hours by themselves"

Variable: Distance education	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	19	51	33		13	63	17	
Percentage	18.45	49.51	32.04		13.98	67.74	18.28	Pr<= 0.0303

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using distance education, before the intervention. The decision is to reject the null hypothesis.**

Hypothesis 2.6 (ii): There is no significant difference between Managers (TNA1) and Employees' After (TNA3) preference for "distance education" training

Table 6.31. Fisher's Exact Test between TNA3-TNA1 for the format of training "Distance education where employees study after hours by themselves"

Variable: Distance education	TNA3 Employees			TNA1 Managers			Fisher's Exact Test
	1	2	3	1	2	3	
Frequency	20	39	34	13	63	17	
Percentage	21.51	41.94	36.56	13.98	67.74	18.28	Pr<= 0.0015

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using distance education, after the intervention. The decision is to reject the null hypothesis.**

Hypothesis 2.6 (iii): There is no significant difference between "Employees before (TNA2) and Employees after (TNA3)" preference for "distance education where employees study after hours by themselves"

Table 6.32.   Contingency table for "Employees before (TNA2) and Employees after (TNA3)" preference for "distance education"

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	13	07	00	20
2= Sometimes	01	29	09	39
3= Always	01	10	23	34
Total (effective sample size)	15	46	32	93
Frequencies Missing				18
Simple Kappa Statistic (SKS)	**Since SKS = 0.5237. The result is fair. Therefore we cannot reject the null hypothesis.**			

INTERPRETATION OF THE FINDINGS ABOUT DISTANCE EDUCATION TRAINING

Both the H2.6 (i) and the H2.6 (ii) null hypotheses stated that there was no significant difference between managers' and employees' preferences for distance education where employees study after hours by themselves. Fisher's Exact Test between TNA2-TNA1 and TNA1-TNA3 showed that both the null hypotheses could be rejected.   This means that managers actually feel different when it comes to employees studying via distance education institutions.

By themselves employees also held fast to their preference and yielded a fair Simple Kappa Statistic. This means that the null hypothesis, that there is no significant difference in employee perceptions before and after the intervention; cannot be rejected. This means that employees held on to their convictions that distance education is a form of training they would want to participate in.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: SELF-TRAINING USING BOOKS/JOURNALS AND MAGAZINES

The next comparison is between TNA1 and TNA 2 on who prefers "self-training using books/journals and magazines" or not as a means of training staff members.

Hypothesis 2.7 (i): There is no significant difference between Managers (TNA1) and Employees' Before (TNA2) preference for "self-training using books, journals and magazines"

Table 6.33. Frequencies of the format of training: "self-training using books, journals and magazines"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	08.99	06.80	10.64
Sometimes = 2	59.55	52.43	41.49
Always = 3	31.46	40.78	47.87

The difference between TNA1 and TNA2 frequencies, according to H_2 Table 7, is that more managers (60%) believe in self-training for their employees to use "sometimes", while only 52% of employees prefer it. While 34 management respondents declined to answer this question, only seven employee respondents declined to state their preferences. There could be many reasons for managers not to have answered this question, including that they may not directly know how their employees self-train.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 191, with 42 frequencies missing. The comparison is presented in Table 6.34.

Table 6.34. **Fisher's Exact Test between TNA2-TNA1 for the format of training: "self-training using books, journals and magazines"**

Variable: Self-training	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	7	54	42		7	53	28	
Percentage	6.80	52.43	40.78		7.95	60.23	31.82	Pr<= 0.4572

The probability that this difference (shown in Table 6.34) in preference between managers and employees is due to chance alone is more than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using the self-training training format, before the intervention. The decision is not to reject the null hypothesis.**

Hypothesis 2.7 (ii): There is no significant difference between "Managers (TNA1) and Employees' After (TNA3)" preference for "self-training using books, journals and magazines"

The comparison between TNA 3 employees and management used an effective sample size of 182 respondents, with 43 missing respondents.

Table 6.35. **Fisher's Exact Test between TNA3-TNA1 for the format of training "Self-training using books, journals and magazines"**

Variable: Self-training	TNA3 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	10	39	45		7	53	28	
Percentage	10.64	41.49	47.87		7.95	60.23	31.82	Pr<= 0.0403

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using the self-training training format, after the intervention. The decision is to reject the Null Hypothesis.**

Hypothesis 2.7. (iii) There is no significant difference between Employees Before (TNA2) and Employees' After (TNA3) preference for "self-training using books, journals and magazines"

Table 6.36. Format of training: "Self-training using books, journals and magazines" SKS between TNA2-TNA3

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	04	05	01	10
2= Sometimes	02	29	08	39
3= Always	00	16	29	45
Total (effective sample size)	06	50	38	94
Frequencies Missing				17
Simple Kappa Statistic (SKS)	**Since SKS = 0.4120. The result is fair. Therefore we cannot reject the null hypothesis.**			

INTERPRETATION OF THE FINDINGS ABOUT SELF-TRAINING

The null hypotheses $H_{2.7}$ (i) and $H_{2.7}$ (ii) stated that there was no significant difference between managers' and employees' preference for self-training using books, journals and magazines. The $H_{2.7}$ (i) null hypothesis could not be rejected since the Fisher Exact test yielded a statistic that was not significant. However between managers and the second round of employees (TNA1-TNA3), the $H_{2.7}$ (ii) null hypothesis could be rejected. The result leans toward the notion that the employees in the comparison between TNA1-TNA3 changed their minds about self-training preferences during the TNA3 measurement.

However when examining the employees only (TNA2-TNA3), the Simple Kappa Statistic was fair and therefore we could not reject $H_{2.7.}$(iii). It appears that the employees retained their convictions about the importance of self-training amongst themselves. Perhaps employee preferences for self-training instead of using other alternatives, are rooted in self-efficacy and is not dependent on outsiders such as managers. More information would be required before drawing any meaningful insights.

HYPOTHESIS 2 (CONTINUED) FOR THE VARIABLE: WEB/ONLINE TRAINING

The next comparison is between TNA1 and TNA 2 on who prefers "web/online training" or not as a means of training staff members.

Hypothesis 2.8 (i): There is no significant difference between "Managers (TNA1) and Employees before (TNA2)" preference for "online/ web courses"

Table 6.37. Frequencies for the format of training: "online/web courses"			
NB: Frequencies recorded where TNA1 =123, TNA2 = 110 and TNA3=102	TNA1/ MNGT	TNA2 / EMP	TNA3 / EMP
Never = 1	20.69	16.67	18.28
Sometimes = 2	63.22	50.00	48.39
Always = 3	16.09	33.33	33.33

The difference between TNA1 and TNA2 frequencies in H_2 Table 8 is that exactly the same percentage of managers prefer "always", as employees who prefer "never", for the format of online training. It appears that more managers (63%) believe in online courses for their employees to use "sometimes", while only 50% of employees prefer it. While 36 management respondents declined to answer this question, only eight employee respondents declined to state their preferences. There could be many reasons for managers not to answer the question, but one possibility is that they may be unsure about their employees' Internet access.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 189, with 44 frequencies missing.

Table 6.38. Fisher's Exact Test between TNA2-TNA1 for the format of training: "Online/web courses"

Variable: Online/web/ Internet	TNA2 Employees				TNA1 Managers			Fisher's Exact Test
	1	2	3		1	2	3	
Frequency	17	51	34		18	55	14	
Percentage	16.67	50.00	33.33		20.69	63.22	16.09	Pr<= 0.0238

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA2) for using the online/web/Internet training format, before the intervention. The decision is to reject the Null Hypothesis.**

Hypothesis 2.8 (ii): There is no significant difference between Managers (TNA1) and Employees "after" (TNA3) preference for "online/ web courses"

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 180, with 45 frequencies missing.

Table 6.39. Fisher's Exact Test between TNA 3-TNA1 for the format of training: "Online/web courses"

Variable: Online/web/ Internet	TNA3 Employees			TNA1 Managers			Fisher's Exact Test
	1	2	3	1	2	3	
Frequency	17	45	31	18	55	14	
Percentage	18.28	48.39	33.33	20.69	63.22	16.09	Pr<= 0.0268

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a statistical difference between the managers (TNA1) and employees' preferences (TNA3) for using the online/web/Internet training format, after the intervention. The decision is to reject the null hypothesis.**

Hypothesis 2.8 (iii): There is no significant difference between "Employees before (TNA2) and Employees after (TNA3)" preference for "online/ web courses"

Table 6.40.   Simple Kappa Statistics between TNA2-TNA3 for the format of training: "online/ web courses"

Group	Employees Before (TNA2)			
Employees After (TNA3)	1= Never	2= Sometimes	3= Always	Total
1= Never	10	04	03	17
2= Sometimes	02	34	08	44
3= Always	01	10	20	31
Total (effective sample size)	13	48	31	92
Frequencies Missing				19
Simple Kappa Statistic (SKS)	**Since SKS = 0.5017. The result is fair. Therefore we cannot reject the null hypothesis**			

The difference between TNA2 and TNA3 frequencies is that there is no real difference. Only one more employee was a non-respondent (9 as opposed to the previous 8). The employees who "always" use the web stayed true at 33% without any changes. The employees who preferred "sometimes" in TNA2, moved marginally (2%) towards "never" in TNA3.

INTERPRETATION OF THE FINDINGS ABOUT ONLINE/WEB COURSES

The null hypotheses $H_{2.8}$ (i) and $H_{2.8}$ (ii) stated that there is no significant difference between managers' and employees' preference for online/ web courses as a form of training. In both instances the Fisher Exact tests yielded significant results to allow the null hypotheses to be rejected. This means that managers again did not prefer web courses as suited to their employees needs or perhaps they did not know what their employees might prefer. The reality shows the employee samples as leaning towards sometimes/always for the option of online/web training for themselves. We can safely say that there is a gap between managers and employees on this form of training.

FURTHER INTERPRETATION OF THE FINDINGS ABOUT ONLINE/WEB COURSES

When the employee groups were compared (TNA2-TNA3), the Simple Kappa Statistic again yielded a fair result. This means that the null hypothesis $H_{2.8}$ (iii) that stated that no significant difference existed amongst employees before and after the intervention; cannot be rejected. This means that the employees' views on web/online training as a preferred form of training remained the same, even after the supply chain awareness intervention.

In summarising the TNA2-TNA3 comparisons for Hypothesis 2, we found that employees did not significantly change their preferences to match their TNA2 responses. In fact, all 8 variables (training formats) received FAIR Simple Kappa statistics. In practical terms, this implies that employees did not change their minds within the 48 hours in which they tested on TNA2 and thereafter TNA3. The figure that follows below summarises the Simple Kappa Statistics for the 8 variables compared between employees samples (TNA2-TNA3) only.

Figure 6.6. below summarises the Simple Kappa Statistics for the eight variables compared between employees samples (TNA2-TNA3) only.

Figure 6.6.   The Simple Kappa Statistics for the 8 variables compared between employees samples (TNA2-TNA3) only.
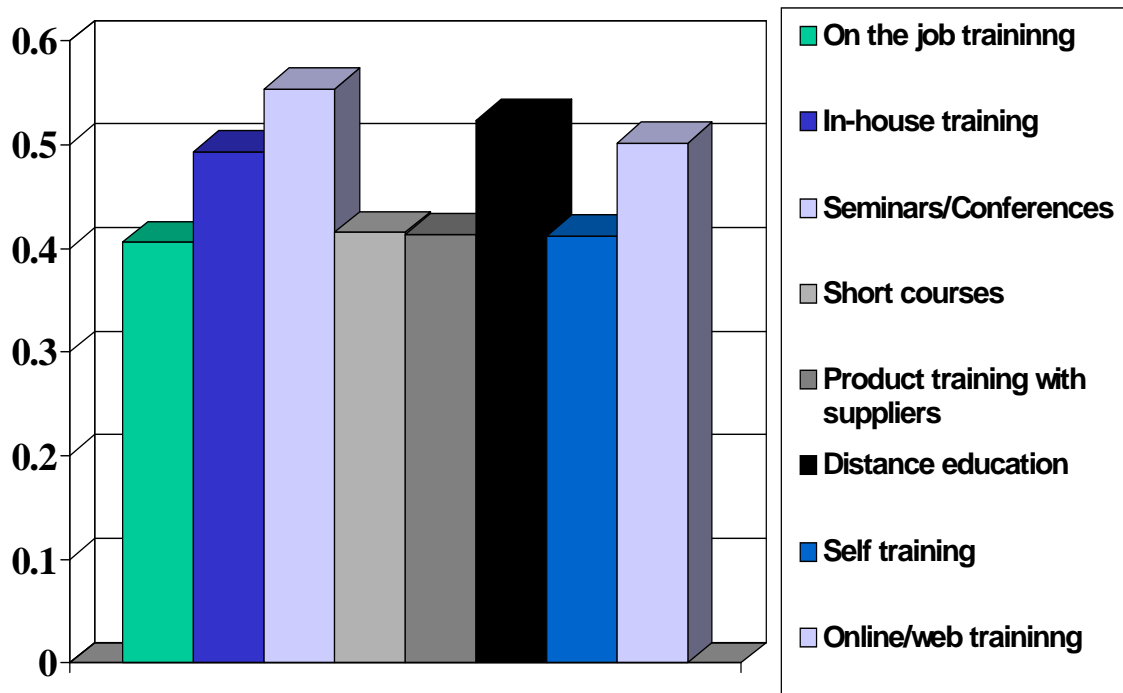
Source: Author's own compilation based on empirical results

The Simple Kappa statistic works on the same principle as the McNemar before and after tests for linked samples. As mentioned before in the $H_{1.3}$ section of this chapter, only results of the Simple Kappa Statistic (SKS) that are above 0.75 are considered significant enough to justify that the null hypotheses should be rejected. Based on this premise, all the SKS values in Figure 6.6. are below 0.75 and are considered Fair. This means that none of the H_2 variables yielded significant results for the employee (TNA2-TNA3) groups.

The original null hypothesis for $H2_0$ proposed that there were no significant differences between managers and employees regarding the format of training they preferred. Testing the eight variables connected to the format of training, revealed many reasons to reject their individual null hypotheses. The

findings of the statistical tests and subsequent decisions regarding the Null hypotheses for TNA1-TNA2 and TNA1-TNA3 are summarised in H_2 Table 6.41. below. The findings for Hypotheses 2.1 until 2.8 are contained in this chapter while the implications of these findings are discussed in Chapter 7.

Table 6.41. Summary of the format of training (H2) hypotheses for Managers (TNA1) versus Employees (TNA2 and TNA3)

H_2 Variable on Format of Training	Fishers Exact test results TNA 1 and TNA2	Decision to accept/reject the Null Hypotheses	Fishers Exact test results TNA 1 and TNA3	Decision to accept/reject the Null Hypotheses
1.On-the-job	Pr <=0.09	Cannot reject H_0	Pr <=0.0085	Reject H_0
2. In-house	Pr <=0.0078	Reject H_0	Pr <=0.0603	Cannot reject H_0
3. Seminar/ Conference	Pr <=0.0036	Reject H_0	Pr <=0.0023	Reject H_0
4. Short Courses	Pr <=0.0001	Reject H_0	Pr <=0.0001	Reject H_0
5. Product training with suppliers	Pr <=0.0001	Reject H_0	Pr <=0.0001	Reject H_0
6. Distance education	Pr <=0.0303	Reject H_0	Pr <=0.0015	Reject H_0
7. Self training	Pr <=0.45	Cannot reject H_0	Pr <=0.0403	Reject H_0
8.Online/ web training	Pr <=0.0288	Reject H_0	Pr <=0.0268	Reject H_0

Source: Author's own compilation

Figure 6.6. shows that the summary statistics and the frequency tables were not substantial enough evidence to make conclusions about managers and employees preferences for specific training formats. The value of the statistical testing is that a more objective picture is presented to compare managers and employee responses to training formats. Since there are statistically significant differences in the preferred format of training between managers and employees, Chapter 7 has a few recommendations to consider under $H2_0$. This concludes the discussion of the Hypothesis 2 variables and

their findings. The next section deals with the five reasons that may or may not motivate employees to attend training.

SECTION THREE: COMPARATIVE TESTS BETWEEN TWO EMPLOYEE GROUPS (TNA2 AND TNA3) AND THE MANAGERS (TNA1)

$H3_0$: **There is no significant difference between managers' and employees' perceptions regarding the reasons motivating employees to attend training**

$H3_A$: **There is a significant difference between managers' and employees' perceptions regarding the reasons motivating employees to attend training**

REASONS MOTIVATING STAFF TO ATTEND TRAINING

The reasons given as motivating reasons to encourage employees to attend training included: improved prospects of promotion, industry novelty, zero cost to the employee, to escape the workplace and insistence from supervisory staff. Managers were asked to agree/disagree in TNA1 with the given statements that would motivate their employees to attend training. In TNA2 and TNA 3, the employees were asked to agree/disagree with the same questions. Discrepancy would indicate differing views about reasons motivating employees to attend training between managerial level and non-supervisory levels.

This question used a Likert scale where 1= strongly disagree, 2 = disagree, 3= neutral, 4= agree and 5= strongly agree.

Table 6.42. Frequencies regarding training attendance motivated by "prospects for promotion"

H3.1: Employees would attend training if they knew it would help them get promoted						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	03	03.03	11	10.38	05	05.15
2 = disagree	05	05.05	12	11.32	17	17.53
3= neutral	08	08.08	11	10.38	07	07.22
4= agree	64	64.65	38	35.85	42	43.30
5= strongly agree	19	19.19	34	32.08	26	26.80
Total responses (n)	99		106		97	
Frequency missing	24		04		05	

It appears from the frequencies in Table 6.42, that employees did change their views about training and promotion between TNA 2 and TNA3. Employees seemed to congregate to "agree" that a motivational reason to attend training would be if it would assist them in their aspiration to be promoted. To the contrary some employees also simmered down from "strongly disagree" to merely "disagree". Since 8 respondents less took part in TNA 3 than those in TNA2, it would be pompous to make any definite conclusions except to say that employees could change their views about training and promotion prospects within 48 hours. However from both managers' and employees' responses it appears that future promotion prospects would motivate employees to attend training.

Table 6.43. Frequencies regarding training attendance motivated by "the need to stay informed"

H3.2: Employees would attend training if the course was new and they had to stay informed.						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	02	02.06	03	02.80	02	02.00
2 = disagree	06	06.19	03	02.80	00	00.00
3= neutral	12	12.37	01	00.93	01	01.00
4= agree	56	57.73	25	23.36	34	34.00
5= strongly agree	21	21.65	75	70.09	63	63.00
Total responses *(n)*	97		107		100	
Frequency missing	26		03		02	

Table 6.43, shows that employees are eager to learn about something new in their industry and this motivates them to attend training. They agree to a greater extent than what management did about the motivational pull of being trained when something is new in their industry. This means that new training topics can be a good reason for drawing employees towards training.

Table 6.44. **Frequencies regarding training attendance motivated by the training being "for free"**

H3.3: Employees would attend training if the training course was free.						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n= 102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	12	12.50	13	12.87	10	10.31
2 = disagree	28	29.17	24	23.76	25	25.77
3= neutral	19	19.79	11	10.89	11	11.34
4= agree	31	32.29	33	32.67	32	32.99
5= strongly agree	06	06.25	20	19.80	19	19.59
Total responses (n)	96		101		97	
Frequency missing	27		09		05	

From Table 6.44, employees agree more than the dissidents that free training courses would be a good reason to attend training in both TNA 2 and TNA 3. Managers seem to be divided almost equally amongst themselves, whether free training would motivate their staff or not, to attend training. Perhaps this indicates a call to action for HR professionals and skills development officers. Perhaps it is time to start asking employees about training more directly instead of asking managers in general, what they think employees think about free training.

Findings from Table 6.45 follows on the next page…..

Table 6.45. Frequencies regarding training attendance motivated by "time off from work"

H3.4: Employees would attend training if the training course would get employees some time off/away from the workplace.						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	15	15.63	19	18.63	09	09.28
2 = disagree	27	28.13	22	21.57	33	34.02
3= neutral	25	26.04	08	07.84	13	13.40
4= agree	20	20.83	38	37.25	33	34.02
5= strongly agree	09	09.38	15	14.71	09	09.28
Total responses (n)	96		102		97	
Frequency missing	27		08		05	

From Table 6.45, management appear ignorant to some extent of how much their employees would or would not value time away from the office for training purposes. This question proved the uncertainty surrounding their employees' preferences, since it yielded the highest occurrence thus far, where 25/96 managers selected the neutral option. Employees from TNA 2 seem in agreement. TNA2 yielded 24 respondents more than those in TNA1 who agree that training accompanied by "time off from work", would be welcomed. After the intervention, in TNA3, employees were exactly equal in their preference for and against time off from the workplace for training purposes. This question would be an interesting point to pursue in future research studies.

Findings from Table 6.46 follows on the next page…..

Table 6.46. Frequencies regarding training attendance motivated by "supervisors' insistence that employees attend training"

H3.5: Employees would attend training if their (superior) supervisor said they should attend training.						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	13	13.54	33	31.73	21	21.88
2 = disagree	34	35.42	35	33.65	45	46.88
3= neutral	24	25.00	14	13.46	06	06.25
4= agree	21	21.88	16	15.38	20	20.83
5= strongly agree	04	04.17	06	05.77	04	04.17
Total responses *(n)*	96		104		96	
Frequency missing	27		06		06	

Management appear to shy away from painting themselves as the 'bad guys' who compel their employees to attend training in this question's responses. The majority of management responses are in disagreement, perhaps in the hope that their employees would have better motivational reasons to attend training. The TNA1 employee response supports the management view that attending training "because the boss said you should" is probably not a good motivator to attend training. An overwhelming 68/104 respondents disagree with this statement. An even bigger proportion of 66/96 respondents disagreed in TNA 3; perhaps reinforcing the notion that employees will not only attend training when their managers insist that they do.

In summarising the tests of proportion amongst the three groups (TNA1, 2 and 3) and reasons motivating employees to attend training, by utilizing Descriptive Statistics alone, the following points would have supported the Alternate Hypothesis to H_3:

- Employee promotion as a motivator to attend training: here managers and employees expressed similar views

- New topics pertaining to the industry: here managers under-estimate employee agreements that this is good motivation to attend training

- Training courses that are for free: Managers are split (half agree and half disagrees) about whether this is good motivation, while employees agree undoubtedly.

- The issue of time-off from work: this is an undecided issue for both management and employees. Management appear a little less confident about whether it would motivate their employees. In turn, the employees are equally split about whether it should/should not motivate anyone to attend training.

- Management insistence to attend training: Both managers shy away from making the boss' insistence to be a motivating reason to attend training. Perhaps managers do not want to appear as too harsh versus the employees who want to be seen not only as "obedient" in the decision to attend training.

Perhaps the above proportions appear "to be expected" and contributing nothing to the existing body of knowledge…. This means that a contrasting variable such as the existing qualification of respondents could be motivating them to attend training or not. **Therefore the proportional evidence is examined further by conducting Kruskal-Wallis one way ANOVA tests for ordinal data.** Perhaps more can be learnt from a statistically significant point of view about the variables motivating employees to attend training.

The specific variables motivating employees to attend training, compared to the employee educational levels, yielded the results presented in Table 6.47. The low respondent numbers required the groups "Bachelors/B.Tech" and "postgraduate Honours, Masters or Doctorate", to be combined. There are therefore only 4 levels of qualifications. When the 4 levels of qualification are contrasted with the respondents' reasons motivating them to attend training, Table 6.47 shows the measures of location per qualification level for TNA2. Note that the highest mean score is indicated in the first column. Non-response equals 11 and Standard Deviation is abbreviated to Std Dev.

Table 6.47. Highest qualifications of Employees (TNA2) and whether they agree with reasons to attend training

Educational qualification level obtained by employees	Statement about variables: "I will attend training if …."
Less than matric	1. it gets me promoted .
Matric	2. I can learn something new.
Matric plus diplomas/ Certificates.	3. it's free.
Bachelors/B.Tech plus postgraduate Honours, Masters or Doctorate combined.	4. I get time-off.
	5. the boss insists that I attend.

Visual inspection of H_3 Table 6.47, shows that employees on four educational levels would be measured against the mean responses in the subsequent pages. When the above variables are compared individually with the levels of qualification in a Kruskall-Wallis one-way ANOVA test, the correlation matrices appeared as in H_3 Tables 6.48-6.52 below. Be reminded that the low respondent numbers required that groups "Bachelors/B.Tech" and "postgraduate Honours, Masters or Doctorate" be combined for the Kruskal-Wallis (K-W) one-way ANOVA test. In each instance data from TNA2 was used for the Kruskal-Wallis tests. There was no corresponding question asked of the management group TNA1.

Table 6.48. Kruskal-Wallis test to determine if Employees (TNA2) with existing qualifications are keen to attend training "for promotion prospects"

Group name /number	Mean Scores
1. Less than matric/ grade 12	3.75
2. Matric / grade 12	3.58
3. Matric plus diplomas & certificates	3.76
4. Bachelors/ B.Tech degree AND Postgraduate Honours, Masters or Doctorate degree	3.85
Kruskal-Wallis *p*-value = 0.9611 [Non-significant= cannot reject null hypothesis]	
Using a Chi-square distribution with (4-1) = 3 degrees of freedom.	

The variable "promotion" appears not to have a statistically significant impact on employees' motivation to attend training. This result is important since the mean values were consistently second highest amongst different qualification levels, which could have led to a wrong conclusion about the promotion variable. In statistics the standardized statistic is called a Z-score. The fact

that the Z-statistics are all smaller than the Z-critical values at both 10% and 5% significance levels, confirms that the $H_{3.1}$ null hypothesis cannot be rejected, based on the promotion variable, either.

The next variable to be tested is the desire to learn something new.

Table 6.49. Kruskal-Wallis test for "Employees (TNA2) with existing qualifications" to see if they are keen to attend training "to learn something new":

Group name /number	Mean Scores
1. Less than matric/ grade 12	3.87
2. Matric / grade 12	4.71
3. Matric plus diplomas & certificates	4.76
4. Bachelors/ B.Tech degree AND Postgraduate Honours, Masters or Doctorate degree	4.69
Kruskal-Wallis p-value = 0.0113 [Significant = reject the null hypothesis]	
Using a Chi-square distribution with (4-1) = 3 degrees of freedom.	

H_3 Table 6.49 reinforces the perception that the motivation to learn something new is a statistically significant variable. This conclusion is supported by Z-statistics of 3 and 3,03 larger than the Z-critical value of 2.64 at the 5% level. The next variable under scrutiny is the one where training is for free.

Table 6.50.   Kruskal-Wallis test for employees with existing qualifications to determine if they are "keen to attend training when it is free"

Group name /number	Mean Scores
1. Less than matric/ grade 12	3.56
2. Matric / grade 12	3.74
3. Matric plus diplomas & certificates	2.97
4. Bachelors/ B.Tech degree AND Postgraduate Honours, Masters or Doctorate degree	2.69
Kruskal-Wallis p-value = 0.0323 [Significant= reject null hypothesis]	
Using a Chi-square distribution with (4-1) = 3 degrees of freedom.	

H_3 Table 6.50 corroborates that the motivation to attend free training is a statistically significant variable.   This conclusion is only supported by Z-statistic of 2.45; which is larger than the Z-critical value of 2.39 at the 10% level.   It is however smaller than the critical value of 2.64 at the 5% significance level.   The next variable for consideration is the one where training allows employees time off from work.

Table 6.51.   Kruskal-Wallis test for employees with existing qualifications to determine if they attend training "to get time off work"

Group name /number	Mean Scores
1. Less than matric/ grade 12	3.25
2. Matric / grade 12	3.45
3. Matric plus diplomas & certificates	2.78
4. Bachelors/ B.Tech degree AND Postgraduate Honours, Masters or Doctorate degree	2.92
Kruskal-Wallis p-value = 0.2107 [Non-significant= cannot reject the null hypothesis]	
Using a Chi-square distribution with (4-1) = 3 degrees of freedom.	

H_3 Table 6.51 corroborates that the motivation to attend have time off work due to training is not a statistically significant variable.   This conclusion is supported by none of the Z-statistic being larger than the Z-critical values at either 5% or 10% levels.   The next variable for consideration is the one where employees see the boss' insistence on attending training as a motivator/not.

Table 6.52. Kruskal-Wallis test to determine if Employees with existing qualifications attend training "when their bosses insist"

Group name /number	Mean Scores
1. Less than matric/ grade 12	2.75
2. Matric / grade 12	2.42
3. Matric plus diplomas & certificates	2.27
4. Bachelors/ B.Tech degree AND Postgraduate Honours, Masters or Doctorate degree	1.62
Kruskal-Wallis p-value = 0.0605 [Non-significant = cannot reject the null hypothesis]	
Using a Chi-square distribution with (4-1) = 3 degrees of freedom.	

H_3 Table 6.52 contradicts that the motivation to attend training only when the boss insists based on a non-significant statistical p-value of 0.0605, but a statistically valid Z-statistic of 2.67 which is larger than the Z-statistic of 2.64 at the 5% level.

Based on p-values in the Kruskal-Wallis one way ANOVA, the Hypothesis 3 section is summarised as follows in Table 6.53:

Table 6.53. Summary of "hypothesis three reasons motivating (TNA2) employees to attend training"

Employees would be motivated to attend training if _____		
Motivating Reason	**Kruskal-Wallis One way ANOVA p-value**	**Decision to accept/reject H_0 at the 5% level of significance**
If it helps employees to get promoted	0.9611	Cannot reject H_0
If the course is something new and employees had to stay informed	0.0113	Reject H_0
If training is for free	0.0323	Reject H_0
If training allows employees some time off from work	0.2107	Cannot reject H_0
IF the boss insists that employees should attend training	0.0605	Cannot reject H_0

Source: Author's own compilation based on empirical data

A critic may comment that employees were ignorant about what motivates them by only using the TNA2 data for the Kruskal-Wallis tests summarised in Table 6.53. Therefore the results of the paired sample *t*-tests using TNA3 data follows in Tale 6.54 below.

In trying to see if the employee views improved towards being more motivated to attend training after having received the SCM awareness intervention, Table 6.54 summarises the Means and Standard Deviation of the employee group's "after" (TNA3) minus "before" (TNA2). The paired sample *t*-tests were conducted to determine the *p*-values. Table 6.54 used n=89 respondents for both TNA2 and TNA3 groups**.**

Table 6.54. Summary of H_3 reasons motivating employees to attend training (a paired sample t-test between TNA2-TNA3)

Employees would be motivated to attend training if _____				
Motivating Reason	**Mean= after- before= difference**	**Standard Deviation**	**_p_-value per variable analysed**	**Decision to accept/reject H_0 at the 5% level of significance:**
If it helps employees to get promoted (V7)			$p =0.404$	Not statistically significant. Cannot reject H_0
After	3.66	1.19		
Before	3.76	1.22		
Difference	-0.10	1.13		
If the course is something new and employees had to stay informed (V8)	4.55	0.74	$p =0.93$	Not statistically significant. Cannot reject H_0
After	4.54	0.90		
Before	0.01	1.14		
Difference				
If training is for free (V9)			$p =0.76$	Not statistically significant. Cannot reject H_0
After	3.22	1.33		
Before	3.18	1.34		
Difference	0.04	1.40		
If training allows employees some time off from work (V10)			$p =0.93$	Not statistically significant. Cannot reject H_0
After	2.99	1.37		
Before	3.00	1.22		
Difference	-0.01	1.16		
If the boss insists that employees should attend training (V11)	2.35	1.14	$p =0.21$	Not statistically significant. Cannot reject H_0
After	2.23	1.18		
Before	0.12	0.92		
Difference				

Source: Author's own compilation based on empirical data. Note that Table 6.54 data were rounded off to 2 decimal points.

The implication of not finding any statistically significant p-values at the 95% significance level, suggest that employees were not more motivated to attend training than before the SCM awareness intervention. This may suggest that there are more complex issues to confront in trying to motivate the respondents to attend training, than what the researcher's intervention could achieve in 48 hours.

There would definitely be merit in deeper level investigation into the reasons motivating employees to attend training. The next section deals with the opposite effect of hypothesis three by proposing some reasons that may/may not discourage employees from attending training.

6.3.3. SECTION FOUR: COMPARING THREE GROUPS' DEMOTIVATING REASONS

$H4_0$: **There is no significant difference between perceived reasons demotivating managers and employees from attending training**

$H4_A$: **There is a significant difference between perceived reasons demotivating managers and employees from attending training**

REASONS DEMOTIVATING STAFF FROM ATTENDING TRAINING

The reasons given as demotivating reasons that discourage employees from attending training included: being too busy at work, when one waits for more senior staff to precede you at the training offered, when training is not relevant to current job responsibility and when there is no test/exam for assessment. Managers were asked to agree/disagree in TNA1 with statements provided that would demotivate their employees from attending training. In TNA2 and TNA3, the employees were asked to agree/disagree with the same questions.

Discrepancy would indicate differing views between managerial level and non-supervisory levels about reasons demotivating employees to attend training.

As before, the descriptive statistics are presented for each motivating reason for TNA1, 2 and 3. By initially investigating the proportional responses to the levels of agreement/disagreement, the statistical hypotheses can be reported on with greater conviction. The first reason that employees may offer as a training attendance deterrent, is the very common one of being too busy at work.

> *In the analysis of the 9 hypotheses the reader is reminded that **training needs analyses are abbreviated to TNA.** Hypotheses may be abbreviated to H….*

This question used a Likert scale where 1= strongly disagree, 2 = disagree, 3= neutral, 4= agree and 5= strongly agree.

Table 6.55. Frequencies about being "too busy at work to attend training"

H4.1 (a): Employees would not attend training due to "being too busy at work".						
	Management TNA1 (n= 123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	03	03.16	20	19.42	16	16.16
2 = disagree	26	27.37	49	47.57	51	51.52
3= neutral	17	17.89	11	10.68	17	17.17
4= agree	41	43.16	21	20.39	13	13.13
5= strongly agree	08	08.42	02	01.94	02	02.02
Total responses (*n*)	95		103		99	
Frequency missing	28		07		03	

In Table 6.55 of H_4 it seems managers and employees differ in their response to the statement that being too busy at work is a legitimate reason not to attend training. Fifty one percent of managers agree with the statement while more than 60% of TNA2 and TNA 3 employees disagree. It is however going to be difficult to ascertain whether employees would be determined not to let

busy schedules interfere with training or whether managers would see it as a legitimate reason to postpone training. More in-depth probing would be required in future research endeavours to qualify the obvious gap in opinions.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 198, with 35 frequencies missing. The contingency table yields a Fisher's Exact test probability of less than 0.0001 where $Pr <= 1.645E-10$.

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.0001 at the 5% significance level, at two degrees of freedom. **Therefore there is a significant statistical difference between the managers (TNA1) and employees (TNA2) using the demotivating factor of being 'too busy at work' as a reason not to attend training. This variable would indicate that the null hypothesis must be rejected.**

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 194, with 31 frequencies missing. The contingency table yields a Fisher's Exact test probability of less than 0.0001 where $Pr <= 1.898E-11$. **Therefore there is also a significant statistical difference between the managers (TNA1) and employees (TNA3) using the demotivating factor of being 'too busy at work' as a reason not to attend training. This variable would indicate that the null hypothesis must be rejected.**

The next comparison is about the demotivating reason where employees wait for senior staff to attend training first.

Table 6.56. Frequencies about "waiting for seniors to attend training first"

H4.2: Employees would not attend training due to waiting for their seniors to go before them						
	Management TNA1 (n=123)		Employees Before TNA2 (n=110)		Employees After TNA3 (n= 102)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	25	26.60	30	28.57	24	24.24
2 = disagree	47	50.00	47	44.76	50	50.51
3= neutral	11	11.70	14	13.33	12	12.12
4= agree	07	07.45	08	07.62	08	08.08
5= strongly agree	04	04.26	06	05.71	05	05.05
Total responses (*n*)	94		105		99	
Frequency missing	29		05		03	

From the frequencies in Table 6.56 of H_4 there seems to be unanimous disagreement between managers (at 76%) and employees (at 73% for TNA2 and 74% for TNA3) respectively, with this $H_{4.2}$ statement. By default it means that managers and employees are united in regarding this reason not to attend training, with disdain. Perhaps it is not surprising therefore that the statistical test also yields a non-significant result.

The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 199, with 34 frequencies missing. The contingency table yields a Fisher's Exact Test probability of more than 0.05 where Pr<= 0.9552.

The probability that this difference in preference between managers and employees is due to chance alone is more than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no significant statistical difference between the managers (TNA1) and employees (TNA2) using the demotivating factor of having 'to wait for senior**

personnel to attend training first' as a reason not to attend training. The decision is therefore not to reject the null hypothesis.

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 193, with 32 frequencies missing. The contingency table yields a Fisher's Exact Test probability of more than 0.05 where Pr<= 0.9987. The probability that this difference in preference between managers and employees is due to chance alone is more than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no significant statistical difference between the managers (TNA1) and employees (TNA3) using the demotivating factor of having 'to wait for senior personnel to attend training first' as a reason not to attend training.**

The next comparison is about the demotivating reason where employees and managers state their preferences on tests that may/may not accompany training programs.

Table 6.57. (i). Frequencies for Managers (TNA1) where "tests and exams are the demotivating reason not to attend training"

H4.3 (i) from Managers' perspective: "Employees would not attend if there was NO test or exam involved with the training". Where TNA1 (*n*=123)		
	Frequency	**Percentage**
1= strongly disagree	24	25.53
2 = disagree	42	44.68
3= neutral	16	17.02
4= agree	10	10.64
5= strongly agree	02	02.13
Total responses (*n*)	94	
Frequency missing	29	

From the frequencies in Table 6.57(i) the managers lean more towards disagreement with the statement that employees would be deterred from training in the absence of tests or exams. More than 70% of managers disagree which indicates that they trust their employees not to disregard

training only because the assessment opportunity is lacking. Therefore employees are not demotivated by having no test linked to their training programs, according to the management group (TNA1).

However, the managers' question (from TNA1) was turned around from having no test to assess the employees and possibly award a certificate for passing the test, to the feared position of employees not wanting to be tested after their training. The corollary of the question in Table 6.57(i) tries to determine if employees fear tests or whether they expect them to be a normal part of training. In both TNA2 and TNA3 frequencies, it appears that employees are also not demotivated by the existence of a test or examination at the end of the training.

Table 6.57. (ii). Frequencies for Employees (TNA2 and TNA3) where "tests and exams are a demotivating reason not to attend training"

H4.3 (ii) from Employees' perspective: "Employees would not attend if there WAS a test or exam involved with the training."				
	Employees Before TNA2 (n=110)		Employees After TNA3 (n=102)	
	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	36	33.96	33	33.33
2 = disagree	56	52.83	59	59.60
3= neutral	02	01.89	03	03.03
4= agree	11	10.38	04	04.04
5= strongly agree	01	0.94	00	00.00
Total responses (*n*)	106		99	
Frequency missing	04		03	

More than 80% respectively of the employee groups summarised in Table 6.57(ii), disagree with the statement that tests and exams would demotivate them from attending training. Since the questionnaires differed and are therefore two different variables, no comparative test could be done between TNA1-TNA2 nor between TNA1-TNA3. Instead the paired sample *t*-test was conducted between TNA 2-TNA3 only.

Table 6.57. (iii).   Paired sample test for employees on the demotivating variable of "having tests/exams involved with the training"

H$_{4.3 (ii)}$: Employees would be demotivated to attend training if there WAS a test or exam involved with the training."				
Motivating Reason	**Mean= after-before= difference**	**Standard Deviation**	**p-value per variable analysed**	**Decision to accept/reject H$_0$ at the 5% level of significance:**
If there were a test/exam involved with the training (V14) After Before Difference	1.758 1.853 -0.095	0.664 0.899 0.864	p =0.2878	Not statistically significant. Cannot reject H$_0$

Since the *p*-value for the paired sample *t*-test is not statistically significant (p=0.2878), it shows that employees did not change their views in the 48-hour reflection period.   Therefore there is no significant statistical difference between the employees (TNA2-TNA3) using the demotivating factor of having 'a test/exam' for the training course" as a reason not to attend training. This variable would indicate that the null hypothesis H$_{4.3 (ii)}$ cannot be rejected.

The next comparison is about the demotivating reason where employees would not attend training if they considered it to be irrelevant to their current positions or responsibilities at work.

Table 6.58.   Frequencies about the "lack of relevance as a reason not to attend training"

H4.4: "The training was not relevant to their current responsibilities"						
	Management TNA1 (n=123)		**Employees Before TNA2 (n=110)**		**Employees After TNA3 (n=102)**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1= strongly disagree	14	15.22	22	20.75	18	18.00
2 = disagree	38	41.30	37	34.91	46	46.00
3= neutral	19	20.65	13	12.26	11	11.00
4= agree	20	21.74	23	21.70	18	18.00
5= strongly agree	01	1.09	11	10.38	07	7.00
Total responses (*n*)	92		106		100	
Frequency missing	31		04		02	

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The comparison between the TNA1 group of managers and the TNA2 group of employees yields an effective sample size of 198, with 35 frequencies missing. The contingency table yields a Fisher's Exact Test probability of less than 0.05 where Pr<= 0.0269.

The probability that this difference in preference between managers and employees is due to chance alone is less than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is a significant statistical difference between the managers (TNA1) and employees (TNA2) using the demotivating factor of having 'training that is not relevant' as a reason not to attend training. This variable would indicate that the null hypothesis must be rejected.**

The comparison between the TNA1 group of managers and the TNA3 group of employees yields an effective sample size of 192, with 33 frequencies missing. The contingency table yields a Fisher's Exact Test probability of more than 0.05 where Pr<= 0.1051.

The probability that this difference in preference between managers and employees is due to chance alone is more than 0.05 at the 5% significance level, at two degrees of freedom. **Therefore there is no significant statistical difference between the managers (TNA1) and employees (TNA3) using the demotivating factor of having 'training that is not relevant' as a reason not to attend training. This variable would indicate that the null hypothesis cannot be rejected.**

This brings the comparison on demotivating variables to an end. The next table summarises the findings for Hypothesis 4.

Table 6.59. (i)   Summary of variables "demotivating employees from attending training compared to managers' perceptions"

H_4 Demotivating Variables	Fishers Exact test results TNA 1 and TNA2	Decision to accept/reject the Null Hypotheses	Fishers Exact test results TNA 1 and TNA3	Decision to accept/reject the Null Hypotheses
1. Too busy at work	Pr<= 0.0001	Reject H_0	Pr<=0.0001	Reject H_0
2. Wait for seniors	Pr<=0.9552	Cannot Reject H_0	Pr<=0.9987	Cannot Reject H_0
3. Training and Tests	This test was not performed		This test was not performed	
4. Training not relevant	Pr<=0.0269	Reject H_0	Pr<=0.1051	Cannot Reject H_0

The findings from H_4 Table 6.59 (i) show that employees are not really affected by senior staffers preceding them on training programs before and after the intervention. The variable about training being relevant changed in the 48 hours between the before and after the training intervention. This area suggests an area of further investigation. The summary of comparison between TNA2-TNA3 employee views follows in Table 6.59. (ii) below. This will be expounded on in chapter seven.

The paired sample test for employees on the demotivating variable of having tests/exams involved with the training yielded no surprising results.

Table 6.59. (ii)   Summary of variables "demotivating employees from attending training for TNA2-TNA3"

H.4.: Employees would be demotivated to attend training if "_____."				
Motivating Reason	**Mean= after- before= difference**	**Standard Deviation**	***p*-value per variable analysed**	**Decision to accept/reject H$_0$ at the 5% level of significance:**
… they were too busy at work (V12) After Before Difference	2.347 2.347 0.000	0.976 1.050 1.130	p =1.000	Not statistically significant. Cannot reject H$_0$
… they had to wait for senior staff to attend first (V13) After Before Difference	2.168 2.116 0.053	1.038 1.071 1.124	p =0.6491	Not statistically significant. Cannot reject H$_0$
… there were a test/exam involved with the training (V14) After Before Difference	1.758 1.853 -0.095	0.664 0.899 0.864	p =0.2878	Not statistically significant. Cannot reject H$_0$
… the training was not relevant to their current responsibilities (V16) After Before Difference	2.453 2.568 -0.116	1.165 1.277 1.295	p =0.3858	Not statistically significant. Cannot reject H$_0$

From the summary in Table 6.59. (ii), lower *p*-values would have provided stronger evidence against the null hypothesis. Since none of the *p*-values are statistically significant, it means that there are no difference in perceptions between TNA2 and TNA3. In other words, the employees did not change their minds about the reasons demotivating them to attend training after the SCM training intervention.

The question of how urgent/ not urgent the existing levels of employee qualifications would make them about training is examined in the ensuing section.

6.3.5. <u>SECTION FIVE: TEST OF ASSOCIATION</u>

H5$_0$: **There is no relationship between existing educational qualifications and urgency for employee training**

H5$_A$: **There is a relationship between existing educational qualifications and urgency for employee training**

This hypothesis obtained answers about respondents' existing qualifications separately from the question about the urgency for supply chain management training. The question about urgency was only asked to the employee level respondents, which means that TNA1 did not contain the latter variable about urgency.

The highest qualifications of the management respondents lean positively towards the tertiary level of qualifications as shown in H_5 Table 6.60 below. What is also notable is that all 123 managerial respondents volunteered this information in TNA 1.

It was expected for the South African context that the highest qualifications of the employee respondents would lean away from the tertiary level of qualifications toward more basic educational levels. This is confirmed as shown in the same H_5 Table 1 where 49% of the respondents report qualifications of matric level (about 12 years of basic education) or less. This question was answered well for the employees also since 108/110 respondents volunteered this information in TNA2. It is reassuring to see that 39% (42/108) of employees (from TNA2) have obtained diplomas and certificates after the matric level of qualification. Note that Managers are now abbreviated to MNGT in the table and EMPLOYEES to EMP. Cumulative percentage has been shortened to Cum. %

Table 6.60 follows on the next page…….

Table 6.60.   Highest qualifications reported by TNA 1 managers and TNA2 and TNA3 Employees

The highest educational level obtained at the time of the survey in Jul-Oct 2011	Frequency TNA1 MNGT	Cum. %	Frequency TNA2 EMP	Cum. %	Frequency TNA3 EMP	Cum. %
Less than matric/ grade 12	03	2.44	18	16.67	18	18
Matric / grade 12	03	4.88	35	49.07	30	48
Matric plus diplomas & certificates	30	29.27	42	87.96	38	86
Bachelors/ B.Tech degree	39	60.98	12	99.07	12	98
Postgraduate Honours, Masters or Doctorate degree	48	100	01	100	01	99
Total respondents (*n*)	123		108			100
Frequency Missing	00		02			02

This exact question about employee qualification and the respondents' urgency to attend training question was absent from the TNA1 questionnaire. However when the Employees were pertinently questioned on whether staff with existing qualifications, are not urgent about further training in SCM, their answers reflected as in H_5 Table 6.61. below.

Table 6.61.(i)   Frequencies of staff with "existing qualifications and their urgency to attend further training"

Variable: "Staff with existing qualifications are not urgent about further training".				
	TNA2 Frequency	TNA2 %	TNA3 Frequency	TNA3 %
1= strongly disagree	09	8.57	12	11.88
2 = disagree	34	32.38	37	36.63
3= neutral	29	27.62	23	22.77
4= agree	31	29.52	27	26.73
5= strongly agree	02	1.90	02	1.98
Total responses (*n*)	105		101	
Frequency missing	05		01	

From H_5 Table 6.61 (i), more than 40% of the TNA2 respondents disagreed with the statement that "staff with existing qualifications, are not urgent about further training". About 30% actually agreed with the statement. The TNA3

respondents increased in their disagreement to 49. The neutral respondents changed in the 48 hours between TNA2 and TNA3 towards disagreeing more.

Needless to say, the frequency based evidence alone can be misleading, however the omission of this question from managers' TNA1 prevents a comparative test to be conducted to determine whether it is a significant relationship or not. The comparison was made between employees before (TNA2) and after (TNA3). The results of the paired sample *t*-test are recorded in Table 6.61 (ii) below.

Table 6.61. (ii). **Summary of H_5 employee respondent views about existing qualifications and urgency to attend training (a paired sample t-test between TNA2-TNA3)**

Variable: Staff with existing qualifications is not urgent about further training in supply chain management.				
Motivating Reason	Mean= after minus before= difference	Standard Deviation	*p*-value per variable analysed	Decision to accept/reject H_0 at the 5% level of significance:
Existing qualifications and urgency to attend training (V25)			*p* =0.1584	Not statistically significant. Cannot reject H_0
After	2.71	1.06		
Before	2.87	0.99		
Difference	-0.16	1.13		

There is no difference in employees' perceptions about staff with existing qualifications being not urgent about further training in supply chain management. **Based on the p-value which is not statistically significant since it equals *p* =0.1584, the null hypothesis cannot be rejected**. By default it means that there is scope for a follow-up study on how to manage staff with existing qualifications and the influence their qualifications may exert on urgency about training.

In the context of equal access to education and training, the following hypothesis tested the perception of whether females receive preferentially more training than their male counterparts. Both managers and employees responded to the question about their perceptions. Moreover, the groups' answers were split into male and female views.

6.3.6. <u>SECTION SIX: TEST OF PROPORTION</u>

H6$_0$: **There is no gender-based difference in the perception that female employees receive more training than males**

H6$_A$: **There is a gender-based difference in the perception that female employees receive more training than males**

There is no TNA1 question dealing with this issue. The results are therefore only indicative of employee perceptions. The question posed to the employee TNA2 and TNA3 groups yielded the following responses:

Table 6.62.   Frequencies for the variable that tests whether 'Female employees receive more training than male employees'

Variable: "Females receive more training than males"				
	TNA2 Frequency	TNA2 %	TNA3 Frequency	TNA3 %
1= strongly disagree	32	30.19	22	21.78
2 = disagree	52	49.06	54	53.47
3= neutral	17	16.04	17	16.83
4= agree	05	04.72	07	6.93
5= strongly agree	00	00	01	0.99
Total responses *(n)*	106		101	
Frequency missing	04		01	

From H$_6$ Table 6.62, it appears that most employees disagreed with this statement. From the 110 TNA 2 respondents, 47% were female, so it is rather interesting that 79% disagreed in TNA2 and 75% in TNA3. The reasons for their disagreement cannot be speculated upon without further research and probing.

By separating the male employees' views from the female employees' views, the results obtained for statistical testing yielded H$_6$ Table 6.63 below. Note that the 5-point Likert scale perceptions were re-grouped into Disagreement (scores 1-2), Neutral (scoring 3) and Agreement (scores 4-5 combined). H$_6$ Table 6.63 consists of an effective sample size of 105, with 5 missing. The

re-grouping of data was done to counteract the warning that Chi-square was not an appropriate test and to allow for the Fisher's Exact test to be applied. The results of the statistical test, is the contingency table named H_6 Table 6.63, which follows next.

Table 6.63. Male versus female comparison on whether female employees receive more training than male employees for TNA2.

	MALE	%	FEMALE	%
Strongly disagree and Disagree =1-2	42	73.68	41	85.42
Neutral = 3	13	22.81	04	08.33
Agree and Strongly Agree =4-5	02	03.51	03	06.25
Total (*n*)	57		48	

The resultant grouping of disagreement and agreement yielded the following result on the statistical test application: **Fisher's Exact test yielded a Pr<= 0.1237 at the 5% significance level. This result means there is no statistically significant difference in gender perceptions about whether females receive more training in the workplace. Therefore the $H6_0$ null hypothesis cannot be rejected on the basis of these findings.**

Since there is speculation about whether older people in business organisations actually attend training, or whether training is targeted at younger staff members, the seventh hypothesis is subsequently put forward.

6.3.7. <u>SECTION SEVEN: MEASURE OF PROPORTION & ASSOCIATION</u>

$H7_0$: There is no difference in the frequency of training requests between the late-career-stage employees (older than 45 years) and others

$H7_A$: There is a difference in the frequency of training requests between the late-career-stage employees (older than 45 years) and others

Note that the TNA1 question dealing with this issue referred to older and younger employees while the TNA2 and TNA 3 question specifically asked about being older than 45 years of age. This question was presented to employees to gauge their perceptions: "if employees are older than 45 years of age, they do not request as much training as the younger staff members". The employee results are shown in H_7 Table 6.64. There was no directly corresponding question asked of managers in the TNA1 questionnaire, however a different version of the question asked managers if this is a reason for their employees not to attend training. The managers' findings are recorded in H_7 Table 6.65.

Table 6.64. Frequency of responses by employees in both TNA2 and TNA3.

H7-Variable: "Employees older than 45 years of age do not request as much training as younger staff"				
	Employees Before (TNA2)		Employees After (TNA3)	
	Frequency	%	Frequency	%
1= strongly disagree	17	15.60	27	19.80
2 = disagree	37	33.94	30	29.70
3= neutral	16	14.68	19	18.81
4= agree	33	30.28	24	23.76
5= strongly agree	06	05.50	08	07.92
Total responses (*n*)	109		101	
Frequency missing	01		01	

From Table 6.64. employees appear to be divided on this question. Fifty-four respondents (about 49%) from TNA2 disagreed with the notion that employees older than 45 years do not request as much training as the

younger staff members. This is in contrast to the 39 people (about 35%) who agreed with the statement. From the TNA 3 data, it appears more employees wanted to remain neutral on the issue, than who were previously neutral in TNA2. Also notable is that the proportion which agreed, decreased by the same amount of non-response of the TNA 3 questionnaire.

In contrast the managers' response to whether "employees are too old to attend training" yielded the proportions set out in H_7 Table 6.65.

Table 6.65. Frequency of responses by TNA1 managers about their "employees' age and their willingness to attend/not attend training.

H7-Variable: "Employees are too old for training and therefore only younger ones attend".		
Managers (TNA1)	Frequency	Percentage
1= strongly disagree	36	38.30
2 = disagree	40	42.55
3= neutral	11	11.70
4= agree	06	06.38
5= strongly agree	01	01.06
Total responses (*n*)	94	
Frequency missing	29	

From H_7 Table 6.65, seventy-six managers disagreed with the statement about employees being too old for training. The proportion of managers in disagreement is in agreement with the employee response even though the managers in % TNA1 were not specifically led to believe that employees older than 45 years; are actually considered "old". This suggests that age or being older than 45 years, does not automatically qualify as a demotivating reason for employees not to attend training; albeit from their managers' perspective.

Table 6.66.   Statistics of location for late-career-stage (>45 years old) employees for TNA2 and age

Simple Statistics							
Variable	N	Mean	Std Dev	Sum	Min.	Max.	Label
Variable late-career-stage where employee older >45 years	100	2.83	1.20651	283	1	5	V27
Variable: age of employees	100	35.79	9.47969	3579	19	60	V5

When testing the correlation co-efficient, the values of Rho should be between +1 and -1.

Table 6.67.   The Pearson Correlation Coefficient for late-career-stage (>45 years old) employees for TNA2 and Employee age.

Pearson Correlation Coefficients, N = 100 Prob > |r| under H0: Rho=0	
	Variable (V5): Age of employees
Variable (V27) where employee older >45 years	-0.13651
Variable (V27) where employee older >45 years	p-value = 0.1756

From H_7 Table 6.67. the value of Rho at negative 0.13651 indicates a slightly negative relationship between the chronological age of employees and the over 45 employees' willingness to attend training. **Since the *p*-value is equal to 0.1756, it shows a statistically non-significant relationship and therefore the H_7 Null hypothesis for Employees cannot be rejected.** This hints at the opposite of the Null hypothesis and could mean that the age of being over 45 years of age, does indeed not impact on employee willingness to attend training. This means there is no statistically significant difference in the frequency of training requested between >45 years and others.

6.3.8. <u>SECTION EIGHT: MEASURE OF PROPORTION AND ASSOCIATION</u>

$H8_0$: **There is no significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits**

$H8_A$: **There is a significant difference in the willingness to attend training between long-tenure employees (employed >10 years) in the same organisation and new recruits**

Table 6.68. Frequencies about long-tenure employees and their willingness to attend training.

Variable: "Long-tenure employees are not as willing as young recruits to attend training"				
	Employees Before (TNA2)		Employees After (TNA3)	
	Frequency	%	Frequency	%
1= strongly disagree	14	13.46	14	13.73
2 = disagree	50	48.08	51	50.00
3= neutral	18	17.31	19	18.63
4= agree	18	17.31	17	16.67
5= strongly agree	04	03.85	01	0.98
Total responses	104		102	
Frequency missing	06		00	

From H_8 Table 6.68 about sixty two percent of TNA2 employees disagree with the statement that working for the same organisation for longer than 10 years would make employees unwilling to attend training. This percentage even increased for TNA3 to 64%. Twenty percent and less agree with this statement for both TNA2 and TNA 3. One has to take into account that the majority of the TNA1 management respondents were not employed for more than ten years with their particular organisations in the first place.

By contrasting the TNA2 group's variables "number of years employed, age of respondents and their tenure with the organisation" where they participated in the research study, H_8 Table 6.69 yielded the following statistics of location:

Table 6.69. Statistics of location for long tenure career stage employees for TNA2 and Number of years employed by the same organisation

Simple Statistics							
Variable	**N**	**Mean**	**Std Dev**	**Sum**	**Min.**	**Max.**	**Label**
Variable = long tenure where employee is employed for >10 years	100	2.48	1.01980	248	1.00	5	V28
Variable = number of years employed at same organisation	100	7.98	7.56651	798	1.00	32	V3

Table 6.70. The Pearson Correlation Coefficient for long tenure where employee is employed for >10 years for TNA2 versus the number of years employed by the same organisation.

Pearson Correlation Coefficients, N = 100 Prob > |r| under H0: Rho=0	
	V3 = number of years employed at same organisation
Variable V28= long tenure where employee is employed for >10 years	-0.11656
Variable V28 = long tenure where employee is employed for >10 years	p-value = 0.2481

According to H_8 Table 6.70, there is not a strong correlation between employees' long tenure where the employee is employed for >10 years and the number of years they had been with the researched organisation. **Since**

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the *p*-value is equal to 0.2481, it shows a statistically non-significant relationship and therefore the H_8 Null hypothesis for Employees cannot be rejected. This suggests that long tenure careers that extend beyond 10 years; may very well not impact on employee willingness to attend training, compared to more recently employed employees.

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6.3.9. <u>SECTION NINE: TEST OF PROPORTION</u>

$H9_0$: **Employees are not likely to request more training when employers insist on a repayment contract**

$H9_A$: **Employees are likely to request more training when employers insist on a repayment contract**

Table 6.71. Frequencies about employees' willingness to attend training when employers insist they first sign a contract

Variable: "employees' likelihood to request more training when employers insist they first sign a contract"				
	Employees Before (TNA2)		Employees After (TNA3)	
	Frequency	%	Frequency	%
1= strongly disagree	12	11.32	13	12.87
2 = disagree	32	30.19	31	30.69
3= neutral	16	15.09	21	20.79
4= agree	36	33.96	29	28.71
5= strongly agree	10	09.43	07	06.93
Total responses (*n*)	106		101	
Frequency missing	04		01	

From H_9 Table 6.71, more than 40% of employees disagree that they would be less willing to attend training if organisations insist they sign a (obligation to pay back) contract. However, it seems that employees became more neutral about their willingness to attend training in TNA 3 than TNA2.

In contrast, the question had been re-phrased for managers and their TNA1 frequencies show their perception in H_9 Table 6.72 below. No managers

strongly agreed with this statement and due to the non-response, the option five column had no frequencies.

Table 6.72. **TNA1 Managers' frequencies about employee refusal to sign a contract to pay back before attending training**

Variable: "Employees refuse to sign a contract and therefore did not attend training in the past"		
Managers (TNA1)		
	Frequency	Percentage
1= strongly disagree	35	37.63
2 = disagree	39	41.94
3= neutral	10	10.75
4= agree	09	9.68
5= strongly agree	00	0.00
Total responses (*n*)	93	
Frequency missing	30	

From H_9 Table 6.72, it appears that managers mostly disagreed about whether this statement could have been a true deterrent to employees attending training. The high non-response of 30, is a clear indication that this question was not well received by managers in the TNA1 questionnaire.

Since the issue of signing a contract to repay the costs of training appears to be open for further debate, there cannot be any conclusive argument about employees' nor about managers' views.

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6.4.   SUMMARY OF FINDINGS IN TRAINING NEEDS

The findings of nine hypotheses in total were discussed above.   The conclusions based on the empirical evidence analysed will be expanded in this section.   Findings of managers versus employees, male versus female and between managers and non-supervisory staff are discussed here.   The hypotheses will be discussed in sequence from H1 to H9.   The purpose of this section is to pre-empt the discussions encapsulated in the final chapter.

6.4.2. HYPOTHESIS 2

The H_2 null hypothesis that there is no significant difference between the formats of training preferred by managers and employees yielded different decisions to reject/not reject the null hypothesis based on the specific variable under scrutiny.

The results were obtained by using Fisher's Exact test on contingency tables for independent samples and the Simple Kappa Test for dependent samples. The findings are bulleted below for ease of reference between the 8 variables that were being tested.

6.4.3. HYPOTHESIS 3

The H_3 null hypothesis about reasons motivating (TNA2) employees to attend training yielded different decisions to reject/not reject the null hypothesis based on the specific motivating variable examined.   The managers (TNA1) were asked whether they agreed/disagreed on a 5-point Likert scale with reasons that would motivate employees to attend training.   The reasons given as motivating reasons to encourage employees to attend training included: improved prospects of promotion, training being new, zero cost to the employee, to allow employees to escape the workplace and lastly insistence from supervisory staff.

Initially by examining the frequencies using descriptive statistics, employee promotion, industry newness of training courses and free courses all appeared to be motivators to employee respondents without doubt.

Managers did not agree with employees (from both TNA2 and TNA3) on 4 of the 5 reasons given. The only variable with seemingly straightforward agreement between managers and employees appeared to be the prospect of promotion.

However when using the Kruskal-Wallis non-parametric test (between TNA1-TNA2) to determine whether the relationship between respondents existing qualifications and the variables that motivate them is due to chance alone; new information was uncovered. The K-W one-way ANOVA showed two new statistically significant p-values apart from the promotion motivator. The newness of the training course and whether the training was for free yielded results that made us reject the null hypothesis. The time off work and boss' insistence variables now sided with promotion in us being unable to reject the null hypothesis.

However the picture was not complete without testing employee responses from TNA2-TNA3. The paired sample t-tests yielded 5 results that were not statistically significant. This meant that employees did not change their reasons for motivation based on the SCM awareness intervention or within the 48 hours of reflection.

Overall these results demonstrate that employee motivation lies deeper than what the research study was able to uncover. The results also warn that frequency proportion comparisons can be misleading and inconclusive. Even though we thought that managers and employee agreement on the prospects of promotion seemed to be the only obvious motivator, the findings from the inferential statistical tests proved to the contrary for H_3. The variable of motivation can thus be qualified by using the existing qualifications of respondents as a common starting point of reference.

6.4.4. HYPOTHESIS 4

The H_4 null hypothesis stated that there is no significant difference between reasons demotivating employees from attending training. The demotivating variables included: being too busy at work, waiting for senior staff to attend

training first, training not being relevant to current responsibilities and training without assessment. Overall there seemed to be less of a gap between managers and employees on the demotivating reasons of H_4 than on the motivating reasons from H_3.

Initially the employee perceptions (both TNA2 and TNA3) compared to managers' perceptions appeared to be polar opposites. The variable of 'being too busy to attend training' was perceived as a valid reason by managers, but not by employees. This differing perception was validated through the TNA1-TNA2 Fisher's Exact Test as a case to reject the null hypothesis.

When managers and employees both disagreed that employees would not attend training because they are waiting for senior staff members to precede lower level employees, the Fisher Exact tests (for both TNA1-TNA2 and TNA1-TNA3) confirmed that the null hypothesis should not be rejected. This means that there is no difference between managers and employee views on this statement. Although there may be another underlying reason that would demotivate employees from attending training, I cannot extract any solid truth from the $H_{4.2}$ demotivating reason alone.

The $H_{4.3(i)}$ hypothesis stated that employees would not attend training if there was no test or exam involved with the training. This question was asked of the managers only in TNA1.   Seventy percent of the managers from TNA1 disagreed with the statement (*this combined "strongly disagree" with "disagree figures"). This could possibly be because they have experienced sending employees to training where there was no assessment involved, before the survey.   Or they perceive their employees as not being too concerned whether training has a test or not.

The $H_{4.3.(ii)}$ statement applied to both TNA2 and TNA3 and were answered by employee groups only. The $H_{4.3.(ii)}$ was unintentionally rephrased to say that employees would not attend training if there was a test or exam involved with the training. The employees disagreed more with their statement. In TNA2 about 87% and 93% in TNA3 disagreed with (*) the statement that they would

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stay away from training due to there being a test/exam involved with the training.

The $H_{4.4}$ stated that employees would not attend training if it were not relevant to their current responsibilities. From the descriptive statistics managers (TNA1) and employees (in both TNA2 and TNA3) were reacting in a similar fashion to the statement. Yet the Fisher's Exact tests between TNA1-TNA2 showed a statistically significant reason to reject the null hypothesis. In contrast the Fisher's Exact test between TNA1-TNA3 showed a non-significant result.

6.4.5. HYPOTHESIS 5

The null hypothesis for $H5_0$ stated that there is no relationship between existing educational qualifications and the urgency for employees to attend supply chain training. The question was not asked of the management group and the TNA2 employees were split between 40%: 30% being in disagreement versus agreement with the statement. The TNA3 respondents increased in their disagreement to 49%, which can be attributed to the neutral respondents who changed in the 48 hours between TNA2 and TNA3 towards disagreeing more.

The paired sample t-test did not yield a statistically significant result and therefore the null hypothesis cannot be rejected.

6.4.6. HYPOTHESIS 6

The management level decision makers amongst the respondents, split into 70:30 ratio where males outnumbered the females. This is similar to overseas research respondents in supply chain management. At lower levels of the organisational hierarchy, the employees were split more evenly 53:47 for the ratio male: female. The gender activists may or may not be justified in calling for more female representation at higher managerial levels in South Africa, however the gender variable was used to test if females are perceived

as receiving more training than males. Although females were less than males in the both respondent groups, there appears to be no bias perceived towards females receiving more training in supply chain industries.

6.4.7. HYPOTHESIS 7

The bulk of manager respondents were between the ages of 35-45 years while the employee bulk lay between 29-40 years of age. The age variable was linked to both the perception of being willing to attend training and whether employees could become too old to attend training. In the first incidence, almost 50% of employees disagreed that being older than 45 years of age is enough reason to lessen employee frequency of requests to attend training. More than 80% of management disagreed that only younger employees would attend training. A slightly negative relationship between the TNA2 Employees "before group" about being over 45 and age in general. The data showed a statistically non-significant Pearson Correlation coefficient when tested, which means that the Null hypothesis (that there is no significant difference) cannot be rejected. It is important to note however that there is no evidence nor suggestion from the research conducted that being over 45 years should be classified *old* in the supply chain arena.

6.4.8. HYPOTHESIS 8

This hypothesis tested whether respondents who have been employed for longer than 10 years (i.e. long tenure) would be perceived as less willing to attend training than younger recruits.

For the employee groups (TNA2 and TNA3) 74% of the respondents had been employed by their organisations for <10 years. This means that the majority of employees were now asked to comment on the remaining 26% of the sample or their perception in general. For the management group (TNA1), 25% were employed for less than 2 years and 47% less than 5 years. This implies that managers change jobs or move between supply chain entities more frequently than normal employees. This was to be expected

since their educational qualifications would permit them more liberties/mobility in employment opportunities. This phenomenon is contrasted by the fact that the years employed for managers were longer i.e. between 1-37 years. The number of years for the employees ranged between 1-32 years long.

The results show that the null hypothesis cannot be rejected, which means that the tenure of a person's career at any particular place of employment should not affect the respondents' willingness to attend training. This is a confirmation that HR directors/managers cannot presume that the older employees would be unwilling to attend training.

There is however a limitation to the study since it did not question how many people (with employment longer than 10 years) had already left the participating companies. Since this survey took place after the 2008 global recession, it will not be known whether the participating companies had fired or retrenched employees who had worked for them >10 years. Perhaps they would have altered the current perception or not. The findings from H_8 can be referred back to the need for employees to receive more soft skills training in the future. Perhaps a gap can be eradicated by matching existing job experience with future qualifications worthy of promotion and advancement.

6.4.9. HYPOTHESIS 9

This hypothesis wanted to investigate the fear that employees may have about signing new contracts for retention when they want to attend training programs. During TNA2 the employees were equally divided in disagreement and agreement with the statement provided. In TNA3 they appeared to agree less and remained more neutral than in TNA2. This suggests that there is no absolute clarity about contracts nor are industry specific practices being followed by the participating business entities.

In contrast, the management group overwhelmingly disagreed (at 78%) that the contract threat could have prevented employees from attending training. Perhaps they honestly believe or perhaps are better informed about the

possibility of extra contracts being used before training commences. The fact that the employee groups were not as convincing in their perception as the TNA1 management group, implies that a gap could exists even from an information/communication perspective between managers and employees. On the other hand, the managers could also have been hiding their uncertainty through the non-response of 30 on this particular concern. This chapter will conclude all the hypotheses' findings before making any recommendations in the subsequent chapter.

6.5. CONCLUSION

This chapter reported and analysed the findings of three questionnaires that were administered to a group of managers (TNA1) and two employee groups (TNA2 and TNA3). The overall purpose of the study was to determine if gaps exist in the training needs perceived by managers and employees and amongst employees themselves. The goal was accomplished by testing nine hypotheses against empirical evidence gathered from respondents in the supply chain industry. The findings confirmed that managers and employees do not always share the same perceptions regarding hypotheses about:

1.   the types of training
2.   the format of training
3.   motivating variables
4.   demotivating variables
5.   existing educational qualifications
6.   gender
7.   the demographic variable age (> 45 years)
8.   career tenure (more than 10 years)
9.   and signing new contracts before training.

The findings are briefly summarised according to the Hypothesis number it applied to. The recommendations will be made in chapter 7, where the empirical findings are referred back to the context of broader macro-economics and the literature of existing global scale supply chain management systems. Since the significance of the main findings will be

discussed in the next chapter, this conclusion merely aggregates the training gaps identified by the research data.

Hypothesis one was reassuring in that it assured us of training activities that took place in the 12 months preceding this July-October 2011 research study. Most supply chain functional areas' training is on offer in this country and respondents made use of the opportunities presented to attend training. The gap exists mostly between the training received by managers' versus the employees' training. The former are sent more frequently for both technical and soft skills training. The employees were mainly sent for the technical training but no soft skills training was involved. In order to address the gap, some soft skills courses must be offered to the employees who wish to pursue managerial positions or whom are being groomed for supervisory careers.

Hypothesis two had 8 formats of training (variables) being evaluated between the TNA1, TNA2 and TNA3 groups. The gaps that were found pertained to on-the-job training, in-house training and self-training. These gaps were discovered by the changes from not rejecting the null hypothesis between TNA1-TNA2, only to be rejecting the null hypothesis for the same variable between TNA1-TNA3 or vice versa. The remainder variables all had statistically significant differences between both TNA1-TNA2 and TNA1-TNA3. The variables that were compared between the management and employee groups include: the use of seminars/conferences, short courses, product training with suppliers, distance education and online/web training. These findings caused the null hypotheses to be rejected between TNA1-TNA2 and TNA1-TNA3. In contrast, there were no statistically significant results between the employees before and after the supply chain awareness intervention (i.e. between TNA2-TNA3). The way to address the training format gaps is examined further in chapter seven.

Hypothesis three suggested five motivating reasons as variables to be tested. Since motivation by itself is difficult to prove, the motivating variables were correlated to the existing qualifications of respondents. This shed more light on the categories of qualifications and how each category of respondents will

be motivated to attend training. The two variables that called for the null hypotheses to be rejected are when the courses are for free and whether the courses were new, in order to help respondents to stay informed about their industries. These two variables used a Kruskall-Wallis one-way analysis of variance to demonstrate that there is a significant difference between TNA1-TNA2 on these issues. Thus the intention to learn something new and be on top of industry developments is not such a straightforward motivation to influence employees from a training initiative. The unanswered question for this variable is that the concept of "newness" will be subject to individual training experience variations.

Hypothesis four put forward four reasons that could possibly demotivate employees from attending training. The variables included being too busy at work, waiting for senior members to attend training first, having/ not having tests associated with the training and the relevance of the training to current employee responsibilities.

From the H_4 findings management and staff had different opinions on "being busy" as a deterrent to attend training. Managers thought that being busy was a legitimate reason not to attend training, but employees thought otherwise. Clearly this gap will have a different context in the job environment for every employee and every manager, which chapter seven should advise on.

Both managers and employees in H_4 disagreed with the notion that anyone wanting to attend training should wait for hierarchical level senior staff to attend the training first. Since no statistically significant result came about between TNA1-TNA2, TNA1-TNA3 nor between TNA2-TNA3, the null hypotheses could not be rejected. On the issue of seniority preferential training, unanimous support from respondents show that it would not be best practice to let employees wait for seniors before attending training.

Managers were optimistic that employees would still attend even if there was no test or exam attached to a training program. Employees on the other

hand, disagreed that they would stay away from training if there were a test or exam attached to the training program. This H_4 variable question was not worded in a consistent way between the questionnaires thus no real hypothesis testing could be performed on the data.

The last variable tested under H_4 was the relevance of training and the null hypothesis could be rejected only between TNA1-TNA2. Employees changed their minds to increasing disagreement before and after the intervention. This meant that the null hypothesis could not be rejected for TNA1-TNA3. The high p-value of the paired sample t-test also concluded with the TNA2-TNA3 no rejection of the null hypothesis. This inconsistent result may indicate that the respondents are not sure about the training being relevant to their current responsibilities. It could also demonstrate that they do not think irrelevance should discourage them from attending training.

The H_5 question was posed only to employees. In both TNA2 and TNA3 employees disagreed that staff with existing educational qualifications are not as urgent to attend training. The decision was not to reject the null hypothesis based on the non-significant p-value from the paired sample t-test. This means that existing qualifications should not deter staff from being urgent to attend training amongst respondents.

The possibility of gender discrimination was resolved with the H_6 question. The question was again addressed only to the employee groups of respondents. Since there were no statistically significant differences, we cannot reject the null hypothesis. Neither male nor female employees perceive that females receive more training in the workplace at this point in time.

Hypothesis seven proved that there is no noteworthy relationship between age and the need for training. Being older than 45, was not perceived as a reason to ask for less training. Since the Pearson correlation coefficient did not yield a statistically significant result the null hypothesis could not be rejected. This means that there is no significant difference between

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respondents and their perceptions about late-career-stage (older than 45) potential trainees and their requests for training.

The duration of employment in the same organisation could not directly be age related as in H_7. Therefore hypothesis eight was questioning about employees having been in their organisations for longer than 10 years and their willingness to attend training. Since there was no statistically significant p-value the null hypothesis could not be rejected. The problem with this conclusion was that the average number of years of employees hovered around eight years of employment. chapter seven would definitely have to restructure the career tenure link to training programs for the supply chain context.

From hypothesis nine, it appears that employees do not seem to be deterred by the need to sign another contract linked to training opportunities. In contrast a large percentage of the managers did not respond to this question. Even though the results of this hypothesis were inconclusive, it must be viewed in light of the fact that organisations will differ in their approach to exchange training for continued loyalty. Overall it appears as if contractual obligations would not necessarily deter employees for requesting training opportunities.

The conclusions of the research findings from hypotheses 1 to 9, brings the final chapter in sight. Chapter seven will revisit the research that prompted the development of each individual research variable examined above. The areas of contribution that the research results brought forward; will also be followed by recommendations for future research studies.

CHAPTER SEVEN   CONCLUSION AND RECOMMENDATIONS

7.1.   INTRODUCTION

7.2.   THEORY VERSUS FINDINGS

7.3.   RESEARCH CONTRIBUTION

7.4.   LIMITATIONS OF THE STUDY

7.5.   RECOMMENDATIONS FOR FUTURE RESEARCH
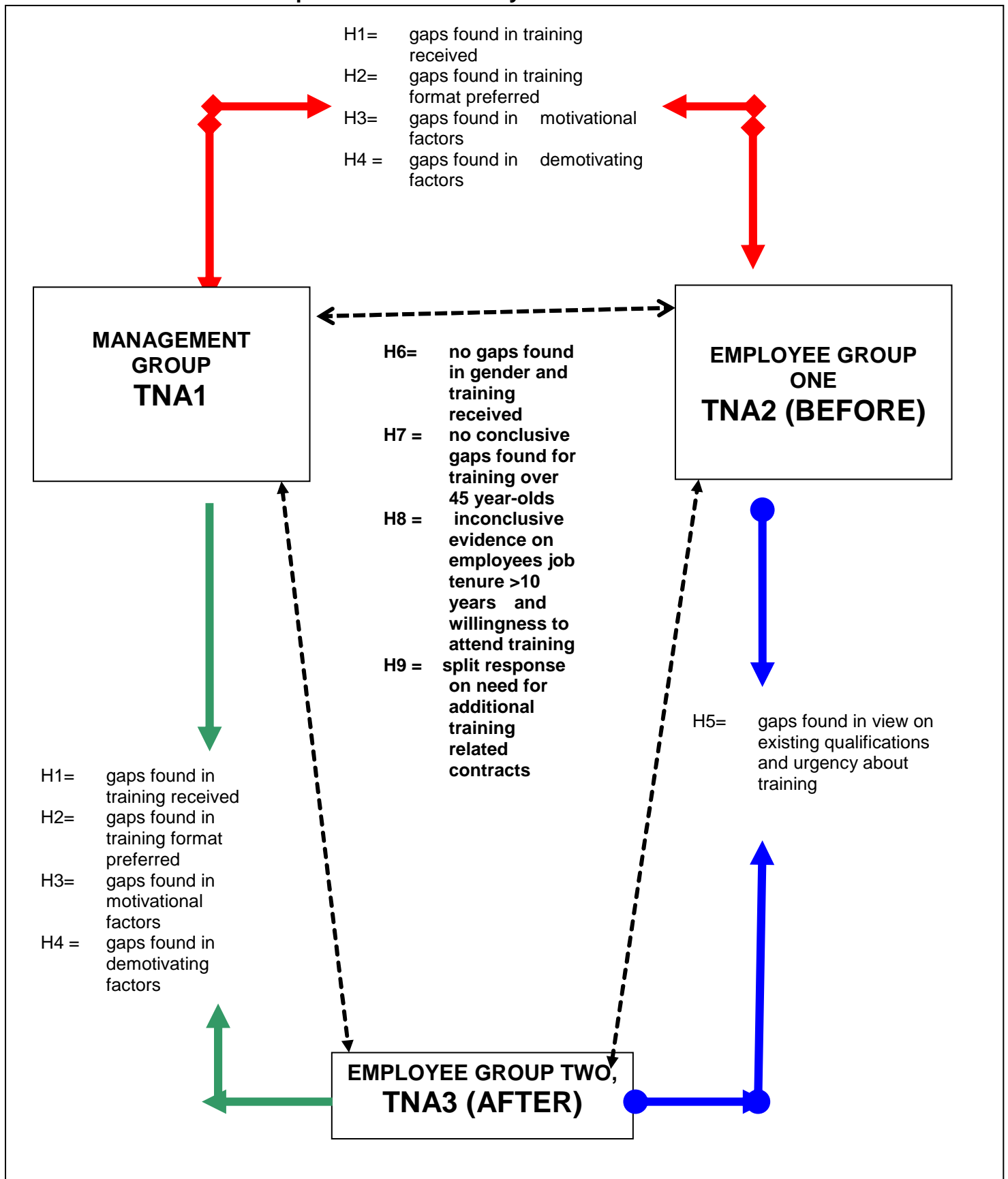
7.6.   CONCLUSION

7.1. INTRODUCTION

This chapter summarises how the research findings are similar to or different from the theory. It aims to conclude the gap analysis of training needs in supply chain organisations by discussing implications for management. The research contribution will be made in the context of the sample characteristics and environment. Limitations of the study will be revisited. However, the recommendations that are made in this chapter cannot be generalised to all other organisations without taking into account that each business is following its own strategy and thus its own training initiatives.

Training courses are often suggested, delivered and advocated when no training needs analyses pre-empted the program implementation. However it is noted that training cannot fix all deficiencies identified during performance evaluations within organisations. The shortage of skills in different supply chain areas such as procurement, manufacturing, transport and logistics, marketing, finance and others require a dedicated effort to identify individual training needs. Gaps can exist between the types of training managers believe they or their employees should be sent on. There can also be gaps in what employees think they need. There can even be gaps in existence after exposing the employees to the same information about the supply chain discipline. The previous chapter demonstrated that employees can change their perceptions and choices within 48 hours.

Trying to find the gaps in the training needs analyses of both managers and employees in the supply chain industry meant targeting both respondent groups with pertinent questions. The research model and hypotheses are illustrated below (Figure 7.1.) to show where the gaps exist between the one management group and the two employee groups. The gaps that were proven to exist are indicated with the numbered hypotheses that tested the findings. The arrows are colour coded to demonstrate which two groups were being compared at the time.

Figure 7.1.   The research model with the gaps identified from the completed research study

H1=   gaps found in training received
H2=   gaps found in training format preferred
H3=   gaps found in   motivational factors
H4 =   gaps found in   demotivating factors

MANAGEMENT GROUP
TNA1

EMPLOYEE GROUP ONE
TNA2 (BEFORE)

H6=   **no gaps found in gender and training received**
H7 =   **no conclusive gaps found for training over 45 year-olds**
H8 =   **inconclusive evidence on employees job tenure >10 years   and willingness to attend training**
H9 =   **split response on need for additional training related contracts**

H1=   gaps found in training received
H2=   gaps found in training format preferred
H3=   gaps found in motivational factors
H4 =   gaps found in demotivating factors

H5=   gaps found in view on existing qualifications and urgency about training

EMPLOYEE GROUP TWO, TNA3 (AFTER)

Source: Author's own compilation

Figure 7.1. lists the most important findings from the research study. Between the management group and the employees, the first four hypotheses were tested and revealed gaps between all three groups. The previous training received, the training format preference and the motivational/ demotivating factors were tested in the first four hypotheses and showed discrepancies between managers and both employee groups. These comparisons are indicated using the red and the green arrows shown in Figure 7.1.

Between the two employee groups (TNA2 and TNA3), indicated by the blue arrows, the fifth hypothesis was used to show gaps in how employees view staff with existing qualifications and their urgency for training. Since this hypothesis did not have a corresponding question being asked of the management group the resultant gap only applies to employees before and after the supply chain intervention.

In the center of Figure 7.1, the inconclusive results of hypotheses six to nine were found between all the groups (TNA1, TNA2 and TNA3). These hypotheses focused on gender, employees over the age of 45, those with job tenure longer than 10 years and contract requirements associated with training respectively.

Each of the hypotheses will now be revisited with reference to the theory that preceded their derivation and focus areas.

7.2. THEORY VERSUS FINDINGS

This section links previous research recorded in the literature to the current findings in the sequence of the hypotheses that were tested.

7.2.1. THEORY VERSUS FINDINGS FOR HYPOTHESIS ONE:

In 2008, Aquino and Draper (2008: 2) tried to develop a common supply chain talent attribute model between academia and business organisations. They

reasoned that if university and professional training programs could not transpose industry needs into their curricula, leaders in supply chain may need to self-train or pay for subject specific expertise themselves. However, if employers decided to "make" their own skilled employees they still had to determine the best types of training required. The Myers *et al.*, (2004: 225) authors recommended that multiple disciplines such as human resources, operations management and even marketing collectively determine how to identify employee skills. Their multidisciplinary approach was used to test which courses the respondents were exposed to in the 12 months preceding the research project for hypothesis one (H_1).

According to Dischinger, Little and Kellso (2008: 21), the gap was not to be found through needs analysis but rather by articulating the supply chain requirements more clearly. This articulation process meant finding common descriptors for the supply chain and the skills required. Thereafter contended Dischinger *et al.*, the human resources could be trained according to the skills level requirements. Hypothesis one was therefore using standard terminology for the courses that were listed and tested.

In the process of listing 12 different training types and subsequently subdividing them into technical and soft skills, a serious discrepancy was uncovered under hypothesis one. To retrace; the questionnaire question allowed for a technical division of courses which consisted of computer software, contract management, financial management; new product training; occupational health and safety, transport, distribution and warehousing. This division was in line with the Council for Supply Chain Management Professionals *career patterns of women in logistics* study, which stated that information technology, systems and software gaps were already in existence in 2009. Women respondents argued that they personally needed accounting and finance. In the 2009 study supply chain business functions such as marketing and transport, were lacking.

While the 2009 women in logistics called for a need for a formal education, including management and supply chain specific education, the current study

appears to have covered most of the technical skills offering in the 12 months preceding the research project. The current research found that functional area training (which the research analysis grouped as "technical skills") had been taking place and that both managers and employees were recipients of the technical training. The current research study focused on the difference between training received by managers versus employees in testing hypothesis one, therefore no real findings were recorded for women specifically on this question. There was also no gender specific enquiry under H_1, but rather under H_6.

While Mangan and Christopher (2005: 181) said finance, information technology, management and strategy were important, they argued that the critical skills would be supply chain specific. This is in contrast with the current research, which found that non-supply chain focused skills training was lacking- especially amongst employees. As a reminder, the division of the five soft skills consisted of negotiation skills, people skills, stress management, supervisory skills and time management. By comparing the groups of respondents it was found that mainly managers had received soft skills training in the 12 months preceding the project. Employees were found lacking in soft skills training for the 12-months time period prior to the research study. The two plausible explanations for this H_1 phenomenon could be that firstly it is generally assumed that only managers need to possess soft skills as part of their job of leading and managing people. Secondly, it could be argued that the function of the employees in the study was non-supervisory and they therefore did not need to have a soft skills training program in their line duties. In both instances, follow-up research would be required to elaborate on the explanation of the H_1 discrepancy or training gap.

The implication of the result of the H_1 gap is that any future form of skills empowerment for employees would require a shift in the type of training being offered. The consequences of addressing this glaring training gap (between TNA1, TNA2 and TNA3) in terms of "soft, technical and the combination of both" skills training may be twofold. Business organisations will enable more currently non-managerial employees to firstly, move up in the ranks in their

supply chain careers or secondly, play a new supervisory role in their existing positions. This call to action for managers, are in line with the Cappelli Principle 2 which said that employees should be trained with generic interchangeable skills, and only specialise as and when gaps arise in the workplace (Cappelli, 2008: 79-80). In response to Cappelli's argument, it may be safe to conclude that a training gap has now definitely been identified in the workplace, with the findings from hypothesis one.

7.2.2. THEORY VERSUS FINDINGS FOR HYPOTHESIS TWO

Hypothesis two questioned the format of training and the respondents' preferences on how training should be delivered. The Marlborough study from 2003 looked at in-house/onsite training, computer based online training, universities and self-study (2003:21).   The TNA1, TNA2 and TNA3 questionnaires included the following formats for respondents to consider namely: on-the-job training, in-house training, seminar/conference training; short courses, product training with suppliers, distance education by yourself, self-training by reading books/journals/magazines; and training via the online/web/Internet environment.

▪ IN-HOUSE TRAINING

The second type of training format under consideration was in-house training. This stemmed from the reasoning that functional areas presented room for training without costing too much, which meant that in-house training was considered beneficial (Cappelli, 2008:78). The view by Hannun (2009:27) was that off-site training may not be best.

The null hypothesis stated that there was no significant difference in the perceptions about managers and employees with respect to "in-house" training. The results initially showed that managers value in-house training in the same way as employees do, since there was a statistical reason to reject the null hypothesis.

However, after the intervention, employees started to think "differently" from their managers about "in-house" training, according to the decision not to reject H_2 null hypothesis. Perhaps training awareness interventions can change the perceptions of employees regarding the "in-house" format of training.

In retrospect of both the literature and the empirical research findings, I am convinced that there is a misunderstanding between managers and employees as to the format of "in-house" training. My speculation, that will require further investigation, is that in-house training can be perceived as a cost saving form of training and may therefore not be perceived as valuable by the recipients. In reality, the 2013 opportunities for structuring dynamic training programs to meet both the objectives of cost-efficiency and being inspirational effectiveness are vast.

- **SEMINAR/ CONFERENCE TRAINING**

The employee views on seminar/ conference training concur with the older views of Garavan (1997:42) which state that skills development is not confined to the classroom or the coaching situation. Although the comparison between managers and employees in both surveys indicated there is no statistically significant difference between them, the supply chain world has a different reality. The option to use seminars or conferences that last two, three or five days as training, includes hidden costs such as daily allowances, transport and accommodation. The consequence of totalling the hidden costs, means that the training budgets will be exhausted more rapidly in one financial year by trying to send many staff members to attend seminars and conferences.

The views of managers are that employees should sometimes be afforded the opportunity whereas employees are always eager to attend. The broader context of organisational structure, hierarchy, culture and training strategy may mean that, while management levels attend conferences and seminars employees are destined to attend less prestigious forums for training. My

educated guess is that seminars and conferences are currently also being used as a reward to managers for fulfilling their other responsibilities.

- **SHORT COURSE TRAINING**

There appears to be a gap or mismatch between the views of managers and employees regarding short courses. It is necessary to clarify the views of both managers and employees on short courses. Perhaps employees know that, as options for themselves, short courses are no real replacement for more long-term training courses. Degrees and year-long certificates are perceived by employers themselves as more valuable than a collection of short courses and employees are well aware of this.

Human resources managers and supervisory managers in industry may not be agreement about the return on investment from the use of the short course as a format of employee training. Either way, this issue merits more debate more between managers and employees in future and each participating organisation should be implementing best practices for its training environment.

In the South African context, the matter of short courses is currently (in the year 2013), being reconsidered by government officials, educators and business organisations. Government officials are hoping the short courses can form part of a widely recognisable qualification for recipients. In my opinion, the issue is far more deep-rooted since, at this point in time the two applicable legislations (the education law and the labour laws) are not integrated in their approach to training, skills development and growth of the employment base. Until the two standards generating bodies can be reconciled, both managers and employees will not be completely confident about the value obtained by using short courses as training formats in the current global supply chain management environment.

- **PRODUCT TRAINING WITH SUPPLIERS**

The views of Othman and Ghani (2008: 261) relate to the linkages that exist generally between trade partners in their respective supply chain networks.

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When businesses audited their suppliers' human resources and processes they concluded that moderate linkage exists. When technical assistance was offered to the suppliers after they had been audited, high linkages were found to exist. The authors found that extensive training in job related and other multiple skills occurs only with high linkage.

The matter of using suppliers as a source of and format for, training, confirmed empirically that respondents and their suppliers were engaged in training. This was reassuring since no direct questions were asked about how a business and its partners were interlinked. The fact that training was being done was a reassuring sign that high levels of linkage do exist, according to the Othman and Ghani (2008: 261) definition of high linkages.

With the current trend in the supply chain management environment the business strategy aims for collaboration amongst business trade partners, including both suppliers and customers. Under the collaboration initiatives, agreements of confidentiality and co-operative training on the products being sold, could improve linkages between business partners. The risk of collusion and poaching of employees by suppliers could possibly steer managers away from the involvement of employees with suppliers for product specific training sessions. The nature of the industry and normal business practices can thus influence the use of product training with suppliers substantially. Employees would consequently be restricted in their use of this format of training even if they are willing to interact more with their suppliers, as shown by the empirical results.

▪ **DISTANCE EDUCATION TRAINING**

The concept of distance education does not always involve Internet based activities and must be kept separate from the online format of training. Distance education involves the submission of reports and assignments via the traditional posting mechanisms and therefore managers may be unaware of all their employees' distance education activities.

The empirical results indicate that this could be a form of training that both managers and employees favour, which would be a highlight for future recommendation to relevant stakeholders. It appears that the respondent group of employees became more decisive about distance education by the time they had completed their second questionnaire. The research results do not make it clear whether employees are becoming more favourably disposed toward distance education activities.

- **SELF TRAINING**

In the manager-employee comparison the results showed an interesting shift by employees from "sometimes" towards "always" as a preference. Although self-training could be a form of training that both managers and employees support; many influences could have swayed employees within their 48-hour reflective period.

The problem with this format of training is that there is no assessment opportunity that would allow employers to monitor how much the training has helped/hindered their employees. Unless employees show marked improvement in either their knowledge, prowess or leadership in the particular area of business where they trained themselves in, it is possible that this form of training may pass unnoticed by managers. Again, no critique may be issued against the principle of self-efficacy that allows employees to use this format of training.

- **ONLINE/ WEB TRAINING**

This format of training will be used by respondents who do not suffer from technology phobia. In the current millennium, there are theories about the different generations' use and perceptions of training content found online. The fact that the web users/online training supporters stayed their course and did not show any shift in preferences, issues a management challenge to engage employees on the format of online/web training. In this way, technological advances may serve the dual purpose of streamlining business processes while being a useful training tool for staff members.

This concludes the commentary on the eight variables that delineated the format of training preferred by both managers and employees. The following hypothesis (H_3) will comment on the factors motivating employees to attend training.

7.2.3. THEORY VERSUS FINDINGS FOR HYPOTHESIS THREE

This hypothesis included five variables that were tested in the light of their ability to motivate employees to attend training. The variables included:

- the prospect of being promoted
- the opportunity to learn something new
- the possibility of the course being free
- attending training in order to get time off work
- attending training at the boss's insistence

Cappelli (2008:81) contended that conflict exists when employees want promotion. This arises from the fact that employers want affordable employees and national interests want higher-level skills in general. According to the empirical results the prospect of promotion proved to be a motivator for employees to attend training.

Cappelli (2008:78) also said firms should let employees share in the advancement decisions or else watch them leave for greener pastures. This is a relevant statement since the demographic information on managers showed the existence of migratory patterns. Some respondents had been in their positions for less than five years. The impact on training could be negative if employers fear that the trained employees will leave for greener pastures as Cappelli argued.

Managers and employees definitely differ on the second and third motivating variables. The two statistically significant findings related to employees learning something new and training being free of charge. Perhaps managers are unaware of how employees perceive the newness of supply chain

training. They could also be unsure about how employees would experience something that is free. This variable of free training was double checked again through hypothesis nine.

The two remaining variables left room for speculation and a need for a follow-up research effort. Employees did not want to be remembered as attending training only to get time off work. Nor did they agree with attending training at the boss's insistence. Perhaps bosses secretly hoped that employees did not loathe their workplaces so much that training would become a welcome relief. Similarly, they did not agree with the notion that employees would attend training only if they insisted they should. Further investigation, perhaps during performance reviews would allow more reasons to surface about the motivators for training. This information could however be considered as generally too sensitive to be divulged.

7.2.4. THEORY VERSUS FINDINGS FOR HYPOTHESIS FOUR

This hypothesis included four variables that could possibly demotivate respondents from attending training. These included:
- being too busy at work
- waiting for seniors to attend first
- tests/exams
- irrelevance to current job

According to McCranken and Winterton (2006:64) time pressures would be an extrinsic barrier to learning. The empirical results revealed that managers and employees differ on whether being busy should motivate /demotivate them from attending training. Employees think they will never be too busy to attend training while, in contrast, managers think that being busy would be a reason for not attending training. The empirical results demonstrate how easy it is for managers and employees to be on different wavelengths on the subject of "busyness", relative to attending training.

Senior staff causing less senior staff to wait before attending training was seen as unacceptable to both management and employee groups.

The remaining two variables between the managers and employee groups, did not yield conclusive results, which, again, means there should be an investigative process to follow up on demotivating variables. Without the follow-up, we may not fully understand reasons that would deter employees from attending training in future.

7.2.5. THEORY VERSUS FINDINGS FOR HYPOTHESIS FIVE

Hypothesis five investigated an objective but important variable of existing educational qualifications and how these influence employees' sense of urgency regarding training. This was based partly on Letseka (2009: 89) who said potential employees graduate with irrelevant skills. This was stated from a developing economy's perspective. The statement from a developed economy's perspective was even more sobering. A Swedish study by Gartel, Jans and Persson (2010: 207) claimed that lower-level jobs were more likely to be destroyed during recessions. By implication, the arguments were that the right educational qualifications could secure employment and be a hedge against job loss during recessions.

The empirical results confirmed the serious nature of the claims made by Letseka and Gartel *et al.*, by reporting that most employee respondents had less than a formal degree while a third of managers were at the bachelors' level of qualifications. The empirical results did not represent the extreme statistics that were put forward by Erasmus, *et al.*, (2007: 125) that under-qualified Apartheid legacy staff meant 81% of 12.8 million people have less than a secondary level qualification. This equalled 10 368 000 people of the South African population in 2007. Technically speaking the respondent sample groups were better qualified than the national statistics' findings from Erasmus, *et al.*, (2007: 125).

Since the research study did not question respondents on their intention to study a Master of Business Administration (MBA) qualification in the short to medium terms, it could not be judged by the same margin as the literature from the State of Logistics Survey. The MBA appeared as the most frequently listed graduate qualification in the 2012 study, which is a positive response the need for this which was identified from the State of Logistics 2009 study. Perhaps the data about the local marketplaces can be updated again now that the census data on educational levels of employees have become available.

The studies completed by Peters (2004:9) and McQuaid, Lindsay & Johnson, (2010:4) both say that respondents who already have existing qualifications makes are more likely to attend training. This is supported by what McCranken and Winterton (2010:4) called the Matthias Principle which states that "those who have shall be given more" in terms of education and training.

Walters claimed that South Africans' initial levels of education will determine their education throughout adulthood (1999:220). Fortunately the findings discussed in chapter six, suggest that those respondents with qualifications are keen to attend further training. However there still appeared to be ambivalence since more than 40% of the respondents disagreed with the statement that "staff with existing qualifications, are not urgent about further training", while about 30% actually agreed with the statement. This may suggest that there are two major opinions on the topic. The empirical results are limited by the fact that the analysis did not link the respondents' views with the harsh reality of their levels of qualifications.

7.2.6. THEORY VERSUS FINDINGS FOR HYPOTHESIS SIX

This hypothesis looked at any gender based difference as to whether female staff members receive more training than males. From the literature it was found that some sectors of the economy train parts of their workforce but not necessarily everyone who has an existing training need (McGrath& Patterson, 2008: 305). In practice training is done for legal and administrative requirements, but not necessarily to meet the training needs (Bushney &

Meyer, 2008:16). When asked about gender previously, McCranken and Winterton (2006:63) recorded that females blamed existing corporate culture for the barrier to their own training. In order to link the gender variable with education (H_6 with H_5) Kara and Murrmann (2011:4) found that female (and less educated) staff were less satisfied at work than males.

Since there was no managerial level question as to whether females receive more training in the supply chain environment than males, the results reflect only the employee views. Between employees there was no statistically significant difference in gender perceptions about whether females receive more training in the workplace. Therefore these findings eliminate some concern about gender being a way to have preferential access to training for the female staff members. The levels of satisfaction from the female staff members were not tested. This is in contrast to the literature reviewed to prevent possible dissent from developing in the participating organisations, after the research study concluded.

7.2.7. THEORY VERSUS FINDINGS FOR HYPOTHESIS SEVEN

The hypothesis was based on the question asked by Marlborough (2003:20), namely what training package should be given to people over 45, as opposed to new recruits. The obvious assumption was that new recruits were much younger than 45 years of age.

The questionnaire addressed to managers referred only to older and younger employees, without specifying any age group. The majority of managers (80%) disagreed that only younger employees would attend training.

The questionnaire used by employees specifically asked about employees being older than 45 years of age. The results indicated a slightly negative relationship between the chronological age of employees and the older employees' willingness to attend training. The results also yielded a statistically non-significant relationship and therefore the null hypothesis for

employees cannot be rejected. This suggests from the sample that being over 45 years of age, does indeed impact on employee willingness to attend training.

The results from testing this hypothesis confirm the need to distinguish between young recruits and older employees in terms of training.

7.2.8. THEORY VERSUS FINDINGS FOR HYPOTHESIS EIGHT

This hypothesis tested whether respondents who have been with their respective organisations for longer than a ten-year-long tenure, would not be willing to attend training. This was based on amongst others, literature from McCranken and Winterton (2006: 63) where mid-career managers, who stayed at their companies for their entire careers, were less likely to seek opportunities for formal training.

The argument put forward by Opperman and Meyer (2008: 3) was that, for decades, management has been slow to send staff for training. According to Opperman and Meyer, the reason for managers' reluctance was the lack of transfer of what was learnt to the workplace. In current times, perhaps it raised the need for employees to start deciding for themselves.

Schmidt (2009: 310) argued that human resource professionals should develop training programs to accommodate job type and tenure rather than demographics. He agreed with Marlborough (2003:20) that older employees have different training requirements from new recruits. The demographics of the respondent supply chain staff covered the age range well enough although the average manager was older than the 20-to-35 year old respondents in Schmidt's study.

The findings recorded in the previous chapter showed that 74% of employees were employed for longer than 10 years, while a total of 48% of managers were employed for less than 5 years! The results concluded that there is actually a significant difference in the willingness to attend training between

those employed for more than 10 years and new recruits. These results caused the null hypothesis to be rejected; which concurs with previous literature findings.

7.2.9. THEORY VERSUS FINDINGS FOR HYPOTHESIS NINE

This hypothesis was prompted by amongst others, the Cappelli Principle 3 which stated that employees should be asked to sign contracts when they are given expensive training. This is based on the fact that American employers expect at least a 20% repayment of the investment -equivalent to the value of the training received- if the employees decide to leave before the appointed time (Cappelli, 2008: 80).

In contrast, Roodhouse and Mumford (2010:325) supported the notion that government policy should provide school level education and hand over responsibility for skills development to the United Kingdom employers. Roodhouse and Mumford also propose including further education and higher education in promoting the education of employed people. This situation is similar to the current research context.

An opposing view by Marlborough (2003: 20) was that training should be free. Venter (2003: 186) argued that in China financially strong companies will select only more highly qualified staff for further training. Venter reports that the rest of the "non-selected" will depend on the government to educate them after gaining employment.

Ashton, Green, Sung & James (2002:5) previously challenged the role of the government as being the sole provider of skills development. Ashton *et al.*, based their argument on the success of seven countries that accelerated skills development into one generation instead of three generations.

This hypothesis had many contradicting literature views. Frazelle (2002: 343) thought that high performing human resources could be retained only by further skills development and the organisation's investment in staff

education. The issue that was unclear was whether the high performing individuals already had existing qualifications and training or not.

One of the challenges identified by the 2009 *career patterns of women in logistics* study was that management development was expected to take place with limited or no training budget available (CSCMP, 2009). McQuaid, Lindsay and Johnson (2010: 8) said the United Kingdom (UK) had removed access to funding issues in the UK by providing funding schemes. The local view stated by Walters (1999: 218) was that although the government's policy was re-assessed since 1990s the Apartheid consequence is that adults are not active learners later in life.

According to the Cappelli Principle 3 on the make-or-buy decision, firms can ask human resources to pay for some of their own training or work out some stretch assignments on their own time (Cappelli, 2008: 78). Cappelli (2008: 78) also links training to long-term strategic thinking by saying that the longer the human resource talent is required in the organisation, the more inclined organisations will be to invest in training the talent.

The research results proved to be inconclusive. More than 40% of employees disagreed that they would be less willing to attend training if organisations insist they sign a (an obligation to pay back) contract. However, it seems that employees became more neutral about their willingness to attend training in their second questionnaire than in their first.

In contrast, the question had been re-phrased for managers and no managers strongly agreed with this statement. This phenomenon makes it appear that managers were not so sure about whether this statement could have been a true deterrent to employees attending training. Managers also displayed a noticeable non-response. The high non-response of 30, is a clear indication that this question was not well received by managers in their questionnaire.

Since the issue of signing a contract to repay the costs of training appears to be open for further debate, there cannot be any conclusive argument about

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either employees' or managers' views. In reality, neither labour law nor educational laws make a uniform provision for whether employees are supposed to sign a contract in order to receive training. Therefore this hypothesis is definitely a case for further investigation.

This concludes the discussion on the nine hypotheses and how their research findings relate to the literature reviewed. The next section deals with the research contribution of the findings to the academic environment and industrial practices.

7.3. RESEARCH CONTRIBUTION

This section comments on the research contribution made by this research to the body of knowledge as well as to the practitioners in industry, labour and education. This contribution is viewed in the light of the 2008 *supply chain foresight* finding that skills shortages are among the top five challenges faced by South African supply chain organisations.

7.3.1. VALUE OF RESEARCH ACROSS DISCIPLINES

Combining supply chain business management, human resources management (training) and adult education into one research study helped to review the merits and demerits of each discipline individually and collectively. It helped to sketch the background and business context more clearly before testing any hypotheses and making recommendations based on the findings.

Since all these disciplines have different histories and focus areas, the commonality between them is made up of the units of analysis, namely employees as respondents. Skilled employees are in great demand and short supply globally. The employees who work for organisations involved in supply chain management displayed gaps in training received, as well as in existing motivational/demotivating training practices. Managers and employees differed even in the format of training they preferred, which demonstrates that strategic thinking should be more focused on people. These findings were

reachable through the combination of the different disciplines, which allows the research to contribute to more than one discipline simultaneously.

7.3.2. VISIBILITY OF TRAINING NEEDS ANALYSES

Both the Council for Scientific and Industrial Research (Logistics News, 2009:11) and the Association of Human Resources Management (Bushney & Meyer, 2008: 19) called for future training needs to be analysed before training programs were implemented.

This research study targeted the main supply chain management associations and prestigious businesses to participate in the investigation. By focusing on the training needs analyses, future training programs could become more targeted to the actual needs of managers and employees. In this way, more value could be obtained for the amount of money being invested in training.

Continuous analysis of the training needs of employees meant that more specific career development paths could be laid out. This is important in view of the fact that managers were displaying a high labour turnover in the current market environment. Employees who may have been exposed to previous Apartheid-era educational deprivation, can also be identified by conducting training needs analyses more consistently.

McGrath and Patterson (2008: 302) highlighted the practice of sending employees for low-level skills training, in order to claim that it had been done. Training needs analyses are intended to help assess the current stage of employees and plan the appropriate level of training to match their more specific training requirements. Conducting training needs analyses, would hopefully assist with including the relevant parts of the workforce in the training programs without favouritism or discrimination (McGrath & Patterson, 2008: 305). This research can contribute to allowing equal access to training for all employees.

7.3.3. IMPROVING THE MOTIVATION FOR TRAINING

The government policies and the accompanying legislation that is meant to help enforce their implementation, previously compromised on the reasons why training was being done. According to Bushney and Meyer (2008: 16) training in industry was done for legal and compliance purposes and not necessarily to alleviate the gaps in training. This study hopefully enables the employees themselves indicate their wish to be involved in making the training decisions that will affect them.

Businesses alone cannot identify the training needs. A co-operative effort on the part of managers and employees is required to help identify actual training needs. In this way, the personal and organisational training needs can be aligned for future improvements. Organisations will then be able to comply with educational and labour laws, and deploy better motives in their contribution to the solution of training problems.

7.3.4. ADDRESSING THE GAP BETWEEN MANAGERS AND EMPLOYEES

The research results identified the following areas where managers and employees may well be misreading and misunderstanding the training perceptions in their organisations. Judging from the Hypothesis Two findings alone, the implications for practical training programs are as follows:

- Implication 1: Management may think they are doing enough training since, in their opinion, employees should "always" be trained "on the job". Perhaps, from the employees' perspective, this is not the preferred training option.

- Implication 2: Management should investigate the staff perception of "in-house" training to eliminate any barriers to training efforts.

- Implication 3: Seminars and conferences as a method of training should also be redefined to ensure that they provide maximum training benefits.

- Implication 4: There is clearly a mismatch here, and a call to action for management to clarify the contrast between their views on short courses and those of the employees.

- Implication 5: Managers prefer not to send employees to suppliers for product training. Specific instances should be investigated especially when employees actually need to gain insight into suppliers' products.

- Implication 6: Distance education appears to be a form of training that both managers and employees support.

- Implication 7: Self-training could also be a form of training favoured by both managers and employees.

The research findings contributed the finer details of training formats to fill in the gaps between managers and employees in the supply chain environment.

7.3.5. ADDRESSING THE GAP BETWEEN TRAINERS AND TRAINEES

This research study used the before-and-after questionnaires which entailed giving employees 48 hours to reflect on the research intervention that was given. This was based partly on the Opperman and Meyer (2008:3) argument that a gap could exist between the training the business expects and the training that is delivered.

When organisations are able to administer an adequate training needs analysis over a period that takes place before and after the actual training, they have more control over the gap that may exist. Trainers will not be misguided by managers' assumptions of what they think their employees need. In this way, there will be less disparity between the expected training

and the training that is delivered. The use of training needs analyses will therefore assist both trainers and trainees to prioritise the goals, content and format of the training to be delivered. This research contributed to enhancing the quality of training design based on measured training needs.

7.3.6. MORE TRAINING MEANS MORE LEVIES RECLAIMED

According to the Skills Development Act, since 2002, at least 120 225 firms have paid their skills development levies over to the Receiver of Revenue as taxes. The funds collected could be redistributed to the business organisations through their applicable Sector Education and Training Authorities (SETAs), after the relevant organisations' employees have undergone training.

As early as 2004, the Human Science Research Council lamented that a disproportionate level of claims were being made, compared to the levies that were collected. It is hoped that conducting training needs analyses, will increase the numbers who attend training courses and hence the money that can be reclaimed from the SETAs. It also means that this research can contribute to preventing funds from lying dormant instead of being applied in the training of employees.

7.4.   LIMITATIONS OF THE STUDY

The following aspects limit the value that the research can bring:

- The study is cross-sectional and patterns of training needs analyses and implementation will require a longitudinal study.

- The respondent companies are all located in one economically advanced province. Perhaps the findings would be different in other, less economically advanced provinces.

- Some of the information could be considered too sensitive to be divulged in a research study. Training needs could be identified in performance management reviews but not be reported in a research study.

- Since government policies and laws are not going to be altered organisations, managers and employees were conducting their training in a structured and constrained environment. Perhaps other laws would set the scene for different behaviours and business practices in a different context.

In the light of the above constraints, a few recommendations are made for the future.

7.5.   RECOMMENDATIONS FOR FURTHER RESEARCH

Addressing national and international training requirements will alleviate skills shortages in the long run but never completely obliterate them. The following are recommended for future research investigations:

- The rising costs of employment and training may involve the application of more digital media in order to disseminate training. A future research project should investigate how organisations use the Internet, their intranets and social media to meet current training needs.
- There should be more in-depth comparison of the statistics on employee qualifications to see if this country lags behind or is on a par with its counterparts.
- The aging population and their approach to training should be investigated in greater depth.
- Government structures should monitor their vehicles for implementation of training more closely. A future research project should compare the training outputs with the skills development plans that business organisations submit to their relevant SETAs.
- A future research investigation should determine whether there is a new role for higher education or not. This should be based on the Roodhouse and Mumford question (2010: 325) that remained unanswered in this study as to whether higher education institutions can accredit other institutions to deliver their educational programs.

- The synergy and co-operation between government, educational institutions and business organisations require a workable framework. This research question has remained unsolved for decades.

Any of the aforementioned proposals for future research will contribute to alleviating the gaps in training needs analysed in the supply chain environment.

7.6. CONCLUSION

The aim of this chapter was to summarise the research findings by connecting each hypothesis with the theory that pre-empted its formulation and investigation. The researcher used nine hypotheses to seek the gaps in training needs analyses by distributing questionnaires to managers via their professional supply chain associations and by being on-site at participating businesses.

The research questionnaires were pre-tested on respondents similar to the sample groups. This was in line with construct validity measure for the mainly quantitative study to be conducted. The research was collected over a period of four months between July and October 2011. The sample size was sufficient to allow statistical tests of inference to be conducted. The research data was analysed so that the findings could make a meaningful contribution to the literature and best practices for training needs analyses in industry.

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