

Biographical predictors of learnership performance in the South African fruit packing industry

by
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Declaration

By submitting this thesis/dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

December 2010

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Abstract

Biographical Predictors of Learnership Performance in the South African Fruit Packing Industry

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Research literature acknowledges that relationships may exist between certain biographical factors (e.g., age, gender and educational level) and training performance. Although learnerships are seen as important training instruments in South Africa (Strong, 2000) the ability of biographical factors to predict learnership performance has never been investigated in the local context.

This study made use of a combination of quantitative and qualitative research designs to investigate the relationship between biographical factors and learnership performance. In this study, measures of age, gender, educational level and learning performance were collected from learners ($N = 340$) who completed the *National Certificate: Fruit Packing and Grading Processes*-learnership.

Statistical analyses, i.e., correlation, multiple regression and analysis of covariance (ANCOVA) were used to investigate the relationship between the predictors and the criterion. Correlation results of $r = .342$ ($r_{rho} = .343$) showed a statistically significant ($p < .01$) positive relationship between educational level and learnership performance. In addition, the multiple regression analysis results suggested that the three independent variables in combination accounted for 11.5% of the total variance in learnership performance. However, only one of the independent variables, i.e., educational level, contributed significantly ($\beta = 0.355$; $t = 6.556$; $p < .001$) to prediction of learnership performance. The interaction between educational level and gender was statistically significant, since the interaction term explained unique variance in the learnership performance not accounted for by the other main effects, $F = 3.967$, $p < .05$.

In the qualitative component of the study, basic individual interviews were conducted with learners ($N=20$) who were selected by means of a combination of purposive - and convenience sampling. The aim of the exploratory basic individual interviews was to seek support for, and provide further clarity on the results of the quantitative analyses. Thematic analyses of the interview content suggested that factors such as facilitator and group attributes, organisation support and career planning may influence individuals' learnership performance. The implications of the results are discussed and areas for further research are highlighted.

Uittreksel

Biografiese Voorspellers van Leerlingskapprestasie in die Suid-Afrikaanse Vrugteverpakkingsbedryf

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Die navorsingsliteratuur is dit eens dat daar verwantskappe kan bestaan tussen sommige biografiese faktore (bv., ouderdom, geslag en opvoedkundige kwalifikasie) en opleidingsprestasie. Alhoewel leerlingskappe as belangrike instrumente vir opleiding in Suid-Afrika beskou word (Strong, 2000) is die vermoë van biografiese faktore om leerlingskap-prestasie te voorspel nog nie ondersoek in die plaaslike konteks nie.

Die huidige studie het 'n kombinasie van kwantitatiewe- en kwalitatiewe navorsingsontwerpe gebruik om die verhouding tussen biografiese faktore en leerlingskap-prestasie te ondersoek. In die kwantitatiewe komponent van die studie is metings van ouderdom, geslag, opvoedkundige kwalifikasie en opleidingsprestasie afgeneem op leerders ($N = 340$) wat die *Nasionale Sertifikaat: Vrugte Verpakking en Gradering Prosesse-leerlingskap* voltooi het.

Statistiese analises, o.a. korrelasies, meervoudige regressie en analise-van-kovariansie (ANKOVA) is gebruik om die verhouding tussen die voorspellers en die kriterium te ondersoek. Die verkreeë korrelasiekoëffisiënte van $r = .342$ ($r_{rho} = .343$) het 'n statisties beduidende ($p < .01$) positiewe verbandskap tussen opvoedkundige kwalifikasie en leerlingskap-prestasie getoon. Verder het die meervoudige regressie-analise aangedui dat die drie onafhanklike veranderlikes saam 11.5% van die variansie in leerlingskapprestasie verklaar. Slegs een van die onafhanklike veranderlikes, d.i. opvoedkundige kwalifikasie, het egter beduidend bygedra ($\beta = 0.355$; $t = 6.556$; $p < .001$) tot die voorspelling van leerlingskapprestasie. Die interaksie tussen opvoedkundige kwalifikasie en geslag was wel ook statisties beduidend, m.a.w., die interaksie term het unieke variansie in die leerlingskap-prestasie verklaar wat nie deur die ander hoofeffekte verklaar was nie, $F = 3.967$, $p < .05$.

In die kwalitatiewe komponent van die studie is basiese individuele onderhoude gevoer met leerders ($N=20$) wat deur 'n kombinasie van doelmatige- en geleentheidsteekproefneming geselekteer is. Die doel van die basiese individuele onderhoude was om op 'n verkennende wyse ondersteuning te soek vir die kwantitatiewe resultate en verder te ondersoek. Die tematiese ontleding van die onderhoudinhoud het getoon dat faktore soos fasiliteerder- en groepeienskappe, ondersteuning van die organisasie, asook loopbaanbeplanning moontlik individue se leerlingskapprestasie kon beïnvloed. Die implikasies van die resultate word bespreek en areas vir verdere navorsing word aangedui.

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Nicholaas Singleton

Stellenbosch

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CHAPTER 1: BACKGROUND AND OBJECTIVES OF THE STUDY

1.1 Introduction

The success of an organisation is closely related to the skills of its human resources and the development thereof (Grobler, Warnich, Carrell, Elbert & Hatfield, 2002). Training is one of the interventions through which an organisation can attempt to develop the skills of its workforce. Training focuses on identifying and developing, through planned learning, the key competencies that enable individuals to perform their jobs (Rothwell, 2005).

Learnerships are training programmes that link theoretical learning and structured workplace experience to provide individuals with the skills and knowledge required to perform competently in an occupation for which there is a clear demand (Lategan, 2002). In South Africa, learnerships are recognised as key training tools (Strong, 2000). The latter is evident in the objectives of the National Skills Development Strategy, which states that by March 2010, at least 125 000 workers must have been assisted to take part in learnerships or skills programmes (Republic of South Africa, 2005).

The impetus for these ambitious targets stems from the fact that, in 2004, it was estimated that there were eight million unemployed people in South Africa (Kraak & Press, 2008). The high levels of unemployment could arguably be partly attributed to the legacy of apartheid, where racial identification linked ethnic group membership with differential access to work - and/or educational opportunities (Kraak & Press, 2008). Learnerships are designed particularly to assist people who are unemployed in gaining access to the world of work (Meyer, Mabaso, Lancaster & Nenungwi, 2004) and, therefore, research should be directed at investigating the possible role that biographical factors play in learnership success.

1.2 Justification for and value of this research

The research initiating question for the present research was: “Which learner-related factors potentially affect learners’ performance on learnership programmes in the

South African fruit packing industry?” To provide answers to this question, a comprehensive literature review was conducted (see chapter 2) which revealed that various factors have been shown to affect training performance in general. Factors that have been found to have a positive relationship with training performance include ability (Gilley, Egglund & Gilley, 2002), locus of control (Cheng & Ho, 2001), motivation (Lefrancois, 2006) and the learning environment (Illeris, 2004).

By implication, these factors may also play a role in learners’ performance on *learnerships* as a specific type of training intervention. In order to conduct learnership programmes effectively in terms of both time and cost, organisations must understand and investigate the influence of these factors on learnership performance. Aside from its practical importance, it is also important to understand the role of these factors on a national level, i.e., from a labour economic viewpoint, since learnerships play an important role in the national economy and the successful implementation of the National Skills Development Strategy (Republic of South Africa, 2005).

Measures of the predictor variables mentioned above are not always feasible to assess during learnership programmes, for various reasons. For example, organisations in the South African fruit packing industry employ large numbers of unskilled and illiterate workers and often experience high labour turnover; hence, conducting traditional psychometric assessments (e.g., of cognitive ability, personality, etc.) would be expensive with questionable return-on-investment in the long run. Despite these concerns, maximising completion rates on learnerships is still an important imperative, since organisations want to justify their human resource development interventions as worthwhile investments (Campbell, 1995). In other words, from a management perspective investigating alternatives to the traditional psychometric predictors of learner performance potentially has practical and economic value since a better understanding of the predictors of learnership performance could help organisations to conduct learnership programmes more time- and cost-effectively if biographical risk factors are identified and managed pre-emptively.

An alternative to psychometric predictors of training performance that could be investigated with potential benefit in the South African labour context lies in the biographical characteristics of learnership participants, otherwise known as *bio-data*. The extant literature on the topic of biographical predictors of learning performance

(e.g., Athanasou, 2001; Kluge & Krings, 2008; Kubeck, Delp, Haslett & McDaniel, 1996; Newton, 2006; Skaalvik, 1990) has clearly shown that relationships frequently exist between biographical factors (e.g., age, gender and educational level) and training performance. Investigating the relationship between biographical characteristics and training performance has special relevance in South Africa due to its socio-economic and political history. In South Africa, socio-cultural constraints (e.g., early marriages) and traditional African family and gender roles of certain cultural groups often establish that women do not require formal education (Mandela, 1993). Similarly, a large number of South Africans have limited previous educational experience as black South Africans only had restricted access to education during the apartheid era (Dias & Posel, 2007). It is possible that these factors have systematically affected various biographic groups' access to, and success within, contemporary South African human resource development opportunities such as learnership programmes. Patterns of failure and success could therefore be expected in terms of the relationship between learnership performance and the biographical characteristics of learners, e.g., gender, age and educational background.

The domain of bio-data, as a source of management information to be utilised in learnership management, holds several advantages above other types of predictor information such as traditional psychometric measures. Biographical data are normally objective, factual and verifiable, since characteristics such as learner age and gender are invariable (Guion & Highhouse, 2006). Furthermore, it is feasible to utilise biographical data in research projects related to learnerships, since the use of biographical data is especially useful in situations where a large number of employees are involved and/or where adequate personnel records are available (Gatewood & Feild, 1990). Despite the ease of use of biographical measures to predict learner performance, there are also several practical and monetary benefits to be gained from a better understanding of the relationship between biographical factors and learnership performance. A clear understanding of biographical factors associated with learnership performance could allow for early identification and support of vulnerable learnership candidates, which could translate to training failure cost savings, higher pass rates and time savings if this information is timeously used for identifying and developing appropriate interventions. Stated otherwise, an adequate comprehension of how bio-data affect learnership performance could assist

management to implement interventions to maximise performance and minimise poor performance. At a national level also any new information that further enables the economical execution of learnerships could help develop learnerships as a training instrument for future use in South Africa.

Despite its clear relevance, research findings on learnerships as structured learning experiences are scarce and the body of applied knowledge is very small (Davies & Farquharson, 2004). An overview of recently published subject-related academic journal articles on major research databases (e.g., Emerald, Psycarticles, Ebsco-host, Sciencedirect, South African E-Publications) for publications in the period from 1999 to 2009, for example, showed no published research on learnerships *per se* (as defined in South Africa) and the factors that determine learnership performance.

Despite this lack of research, learnership success factors could easily be researched. In the South African education, training and development (ETD) environment, the regulatory framework requires detailed information to be documented and captured in learners' portfolio of evidences. Therefore, quality archived data are available for analysis of factors that correlate with learnership success. Furthermore, the statutory requirement of using qualified facilitators, assessors, and moderators all serve to enhance the quality of these data, which makes statistical analyses that could point out causes or factors related to success very promising. However, this type of predictive modelling is seldom done in South African ETD practice, leaving employers ignorant of potential threats to learners' performance in learnerships programmes. Moreover, a lack of understanding of antecedents of learnership performance within specific industries makes it virtually impossible to impose remedial action aimed at enhancing completion rates.

In summary, it can be concluded that research projects examining learnership success factors should thus be undertaken. Clear research findings that suggest relationships between biographical predictors and learning performance could be of benefit to learners, their employing organisations, as well as to the national labour force capacity in South Africa.

1.3 Objectives of this study

The overall objective of this research was to develop and test a specific predictive model of learnership performance. This model focuses on a number of biographical factors that are suggested to relate to learnership performance. It was proposed that the success of learners on learnerships may be predicted from participants' biographical characteristics. In this research, it is not suggested that biographical characteristics are the *only* factors that influence learnership performance, but rather that they could potentially be added to existing models of antecedents of training success.

Although the primary focus of the study was to attempt to predict learnership performance from biographical factors by using a quantitative research approach, qualitative research was used to complement the richness of the research data. Based on the results of the quantitative research, basic individual interviews were conducted with participants in an attempt to shed light on, and further explain, potential inhibiting and supportive factors that affected learnership performance in the present sample.

In light of the arguments outlined above, the specific objectives of this research were:

- To increase understanding of learnership performance in South African learnership programmes by focusing on biographical characteristics of learners (bio-data) as predictors of their learnership performance scores.
- To design a study that was both practically relevant for managers involved in learnerships and valuable for the academic community that is interested in understanding the factors that determine learnership performance.
- To further develop a model of the individual differences that relate to learnership performance by focussing on biographical factors.
- To establish whether significant relationships exist between the biographical variables and learning performance criterion measures included in the proposed model.
- To contribute to the management of learnerships in the South African fruit packing industry in particular by identifying factors that promoted and adversely affected learnership performance in the present sample.

- To explore and utilise available archival data in the best possible way.
- To identify, through basic individual interviews, other factors that relate to biographical predictors of learnership performance.
- To formulate hypotheses for future research.

1.4 Composition of thesis

The composition of this thesis is as follows: Chapter 1 provides an introduction to the research problem, focusing on the relevance of learnerships, the relevance of investigating biographical factors as potentially related to learning performance, and argumentation in support of the possibility that relationships should exist between learners' biographical characteristics and their learnership performance. Chapter 1 also provides an overview of the value and objectives of the research.

Chapter 2 provides an in-depth literature review on the South African human resource development (HRD) context by focusing on legislation and policy documents that regulate learnerships as a training approach. In addition, the variables being investigated in this research are defined, namely: learnership performance and trainee biographical characteristics (i.e., age, gender, and educational level). Based on the literature review, a proposed model of the biographical predictors of learnership performance is presented.

Chapter 3 focuses on the research methodology utilised in this study and describes the research design(s), the formulated hypotheses, the sample demographics, research measures, research procedures and statistical data analysis techniques. Chapter 4 reports on the results of the analyses of the research data and the findings in terms of the research hypotheses. Lastly, the final conclusions of the study and discussion of the results are presented in chapter 5.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In the literature study an attempt is made to continue, and expand on, the mode of reasoning adopted in the introduction section of this paper. The concept of training is very important in the twenty-first century South African organisation. Accordingly, attention is given to explain the HRD context in South Africa. In addition, current South African skills development legislation and initiatives will be discussed in an attempt to present an exploration of personal success factors in learnerships as a viable research project.

2.2 Human Resource Development (HRD) in South Africa

The twenty-first century has brought, and will continue to bring, various challenges to South African organisations. One of these challenges, globalisation, is especially important in terms of human resources, as South Africa must match overseas competition if they are to take advantage of the opportunities presented by new markets. Foreign investors will increasingly compare the skills of the South African worker to that of other nations before making investment decisions. At the moment, with one of the lowest labour productivity rates in the world, South Africa is not doing too well in this regard (Grobler et al., 2002).

Other challenges involve the numerous factors that influence the ways in which industry, commerce and services are organised and the world of work is changing. Structural changes to the nature of national formal economies, for example, less reliance on primary industries (e.g., agriculture and mining) and more dependence on service related industries, hold important skills development implications, as there are fewer opportunities for unskilled employees in the latter (Barker, 2003). Similarly, changes in technology have increased the skills and training needed to perform many jobs in the modern organisation; it has increased the demand for higher skilled employees (Grobler et al., 2002).

The challenge for South Africa in this respect is even greater as the country has an oversupply of unskilled people; people who are either unemployed or in semi-skilled

or unskilled work (Barker, 2003). In addition, South Africa has been rated as having one of the worst human resource development records in comparison with other countries at equivalent stages of development (Lategan, 2002). A generally poor quality of the education system, poor relevance of publicly funded training, and low level of organisational investment into training has been identified as the most important contributing factors (Lategan, 2002).

South Africa's poor performance in developing and utilising its human capital is damaging its international competitiveness, as poor skills profiles inhibit productivity growth in firms, new investment prospects and the employability of young and unemployed people (Barker, 2003). The latter all reduces the possibility of long-term economic growth for the country as a whole.

Human Capital Theory (Barker, 2003) proposes that education and training enhances a person's stock of human capital. While enhancing a person's stock of human capital, education and training increases that person's productive potential, which, in turn, will lead to higher earnings. Massive investment in education and training, therefore, is expected to result in sharp improvements in earnings and standard of living of workers, without causing inflation, as workers will be more productive (Barker, 2003).

By drawing on the principles of Human Capital Theory, government is attempting, via the National Skills Development Strategy and Skills Development Legislation, to address the need for increased investment in skills development. It is hoped that increased investments would improve organisations' competitiveness by means of productivity upliftment (Meyer, Mabaso & Lancaster, 2001).

2.3 HRD regulatory framework

2.3.1 HRD legislation

In keeping with the above-mentioned, the current South African HRD legislation was developed, and introduced, with two specific objectives:

1. To make good quality education and training opportunities more accessible,
and

2. To find ways of financing the envisaged education and training activities.

In an attempt to make good quality education and training opportunities more accessible, the South African Qualifications Authority (SAQA) Act was introduced. The SAQA Act put in place an organisation, the South African Qualifications Authority (SAQA), to establish an integrated framework for learning achievement; this framework has become known as the National Qualification Framework (NQF). The NQF makes training opportunities more accessible by, for example, creating different paths to a qualification (Bellis, 2001).

Additional legislation, the Skills Development Act, No. 97 of 1998 (SDA) was introduced to address the training and investment needs specified. The purposes of the SDA include that it seeks to encourage employers and employees to use the workplace as an active learning environment, and to increase institutional and organisational productivity (Greyling, 2001).

The SDA is aided in achieving its objectives by the Skills Development Levies Act, No. 9, of 1999 (SDLA), of which the main goal is the establishment of a compulsory levy scheme for the purposes of funding education and training activities (Republic of South Africa, 1998). According to the SDLA, employers with a payroll of more than R250 000 per annum are obligated to pay 1% of their salary bill to the South African Revenue Service (SARS) on a monthly basis (Lategan, 2002). The amount paid is referred to as the Skills Development Levy (SDL). On receipt of companies' skills development levies, SARS pays the levies into the National Revenue Fund. From there, twenty percent of the levies collected in respect of each Sector Education and Training Authority (SETA) are allocated to the National Skills Fund (NSF) and the remaining eighty percent, of the levies collected in respect of a particular SETA, are given to that SETA itself. The SETA is responsible for managing their particular sector's funds and for allocating grants to employers, training providers and employees in the prescribed manner (Republic of South Africa, 1999).

Some companies have criticised the SDLA and have argued that the SDL is effectively another form of payable tax that affects companies' overall profitability in a negative way. These companies suggested that they might cut their current internal

training budgets to make up for the SDL paid (Grobler et al., 2002). On the other hand, organisations with a more strategic, long term perspective realise that the success of their businesses are closely related to the development of its human resources (Grobler et al., 2002). These organisations are especially attentive to the ‘employer incentives’ that the skills development legislation holds.

The employer incentives entail that an employer can recover 50% of the original one percent SDL paid via SETA grants (Govender & Bisschoff, 2007). Recovery, in this sense, involves the appointment of a Skills Development Facilitator (SDF) who will be responsible for liaising with the SETA on behalf of the company (Lategan, 2002). In addition, it entails the preparation and submission of a Work Place Skills Plan (WSP), implementing the plan and reporting on it via an annual training report (Lategan, 2002).

On top of the ‘methods of recovery’ mentioned above, organisations are increasingly becoming aware of the possibilities available to present SETA funded training projects. The training projects normally include learnerships and/or skills programmes, as identified in the SDA, and serves as a great opportunity for organisations to actively get involved with skills development. The new ‘joint ventures’ hold important, yet exciting, operational and research implications for the field of industrial psychology; implications that for a start may require exploration of the training instrument ‘learnerships’.

2.3.2 Learnerships

Learnerships, by definition, are formal learning programmes that link theoretical learning and structured workplace experience to prepare employees, and those outside of work, with the skills and knowledge required to perform competently in an occupation for which there is a clear demand (RSA, 1998).

Learnerships are considered to be a very important training instrument to address the skills shortages in South Africa (Strong, 2000). Its status stems from the fact that, on an individual level, a learnership assists individuals in seeking employment and in developing their competence. In addition, at an organisational level, an accumulation of relevant, qualified staff leads to skills depth and competence versatility, which ultimately will result in productivity improvements and/or high-performance

organisations. At a macro level, learnerships contribute to the national skills pool, which facilitates economic growth and social advancement (Van der Schyff, 2005).

The concept of a learnership can be applied to any profession and all SETAs are responsible for establishing learnerships in their respective economic sectors (Grobler et al., 2002). In terms of content, the theoretical learning part of a learnership has to include all the unit standard categories (i.e., fundamentals, core, and electives) to make up a qualification. In addition, the workplace experience must relate to the theoretical learning and must prepare the learners for competence assessment (Lategan, 2002). Bellis (as cited in Lategan, 2002) describe fundamental unit standards as ‘subjects’ like language and mathematics. Learning towards achieving these unit standards forms the foundation needed to undertake further training and/or obtaining a qualification. Core unit standards relate to the compulsory learning required in situations contextually relevant to the particular qualifications. Elective unit standards are a selection of additional unit standards, at the specified NQF level, from which a choice can be made to ensure that the purpose (e.g., enough credits) of the qualification is achieved (Lategan, 2002).

2.4 Learnership performance

2.4.1 Learning

Learning is generally described as a change of behaviour through experience (Gilley et al., 2002). According to Peter Senge (1990) “learning” is closely related to what it means to be human; it is a never-ending process of becoming different from what we were. Learning does not only occur in the workplace, but is rather a continuous process that is also influenced by previous personal life experiences and perspectives (Illeris, 2004). In terms of learning theory, learnerships are based on Bloom’s taxonomy of educational objectives.

2.4.2 Bloom’s taxonomy of educational objectives

Bloom’s taxonomy of educational objectives was originally developed with the purpose of facilitating communication and improvement of exchange of ideas and materials among trainers (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956). The taxonomy distinguishes between three major categories: the cognitive -, the affective -

and the psychomotor domains. The cognitive domain includes educational objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills. The affective domain includes educational objectives that describe changes in interest, attitudes, and values, while the psychomotor domain consists of those objectives that depict manipulative or motor-skill areas (Bloom et al., 1956).

A learnership's structure (i.e., theoretical – and practical components) allows it to encompass the “knowledge”, “comprehension” and “application” elements of the taxonomy's cognitive domain. Knowledge, in this sense, implies the recall of specific facts, methods, processes and patterns, while comprehension and application refers to the ability to explain the knowledge in own words and applying it to a specific situation. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material. The knowledge objectives emphasise most the psychological processes of remembering (Bloom et al., 1956).

2.4.3 Training

Training is an organisation development intervention. More specifically, it is a human process intervention, or an intervention that focuses on people within organisations and the processes through which they accomplish organisational goals (Cummings & Worley, 2005). In terms of definitions, Bass and Vaughan (as cited in Megginson, Joy-Matthews & Banfield, 1993) define training as the “management of learning”.

The primary focus of training is on individuals in their work roles, and thus, it focuses on identifying and developing, through planned learning, the key competencies that enable individuals to perform their jobs (Rothwell, 2005). Training should therefore be seen as the “management of learning” with the underlying objective always being a positive change in the learner, which results in improved performance on the job (Burrow & Berardinelli, 2003).

In terms of format, training usually occurs on the job during formal, structured learning engagements (Gilley et al., 2002). Measurement of what a trainee has achieved in a training context is referred to as the trainee's training performance (Cheng & Ho, 2001).

2.4.4 Learnership performance

The format of the theoretical component of learnership training is similar to the formal, structured, on-the-job learning engagements in which training normally occurs (Gilley et al., 2002). The theoretical component of learnership training is done in a classroom setting where learners attend lectures and are provided with subject-related learning material. Learners' "knowledge" and "comprehension" of the subject is tested in the form of formal written knowledge tests based on the content of the learning material.

The grades that learners attain on the formal written knowledge tests provide an indication of their training – or learnership performance. Learnership performance here refers to "the measurement of the extent of what a trainee has achieved in a training context" (Cheng & Ho, 2001, p. 105). A better understanding of learners' learnership performance (e.g., biographical predictors of learnership performance) may assist practitioners in developing and improving learnerships as a training instrument.

Scholars have, on occasion, considered demographical variables in studies of training performance. These variables have most often been employed as statistical control variables and only rarely have they been the focus of empirical research (Colquitt, LePine & Noe, 2000). According to Colquitt et al. (2000), the two demographic variables that appear most frequently in studies of training are gender and age. Research findings on these relationships will consequently be discussed.

2.5 Trainee biographical characteristics

2.5.1 Age

There is reason to believe that learners' age could affect their training performance. This notion has received substantial research support, most of which has shown that a negative relationship appears to exist between training performance and age, as will be outlined later. Reasons for this have also been investigated, with some researchers speculating that it is partly due to issues such as training participation (Renaud, Morin & Cloutier, 2006) and/or training opportunities (Armstrong-Stassen & Templer, 2005).

In terms of human capital theory and training participation, it is argued that ageing might reduce the incentive for investment in training from both the employee and the employer (Urwin, 2006). Age is negatively related to training participation because as they increase, an individual's perception of the marginal utility of training decreases (Renaud et al., 2006). It has been suggested that older workers fail to take up learning opportunities due to low- or over-confidence in their abilities. On the one hand they fear looking foolish and doubt their ability to learn, and on the other hand, it can be difficult to motivate older or more experienced employees to engage in training (Newton, 2006). The notion of low confidence is supported by Touron and Hertzog (2004) who suggested that the negative relationship between age and training performance might be partially explained by the fact that older adults are often less confident in their abilities to learn new material and retain new skills.

The idea of over-confidence is acknowledged by Rogers (1969) who proposed that the greater the age and accomplishment of people, the less their commitment to training.

Although the availability of training is critical for retaining older workers, older workers are often denied access to training (Armstrong-Stassen & Templer, 2005), with evidence suggesting that older workers are less likely to be trained by their employers (Urwin, 2006). Newton (2006), for example, found a clear association between age and amount of training offered, with employees older than 55 least likely to have been offered training; older workers were more likely to receive on-the-job training.

The reasons for these findings are not clear. In their study, Kluge and Krings (2008) found that most respondents believed that older workers are harder to train. These beliefs are mostly based on the notion that older workers learn slowly, they are unable to grasp new ideas, and older workers offer a lower return on investment as they near retirement age (Charness, Kelley, Bosman & Mottram, 2001; Newton, 2006; Ng & Feldman, 2008). The stereotype is supported by findings of Charness (as cited in Patrickson & Hartmann, 1995), who reported age related difficulties in the acquisition, storage and retrieval of information and in the performance of short-term memory; activities that can be associated with the knowledge element in Bloom's taxonomy of educational objectives. The idea that many cognitive abilities decline with age is congruent with MacDonald, Stigsdotter-Neely, Dergwinger and

Bäckman's (2006) findings that older age accelerated forgetting with regards to associations made during learning, and Thompson and Kliegl's (1991) research results stating that older adults find it more difficult to integrate novel information into available knowledge schemas. Furthermore, the suggestion that performance on fluid measures of intellectual ability declines with age (Denney & Heidrich, 1990) is maintained in Kubeck et al.'s (1996) investigative findings into the relationship between age and job-related training outcomes; results showed poorer performance for older adults, with older adults showing less mastery of training material, and taking longer to complete training programmes. These observations can be related to the comprehension element of Bloom's taxonomy of educational objectives. It is, however, suggested that older adults increase effort when applying knowledge and that older adults, with background knowledge, are more likely, than younger adults, to apply what they have learned (Soederberg, Stine-Morrow, Kirkorian & Conroy, 2004); something that may be connected to the application aspect of Bloom's taxonomy of educational objectives.

According to Salthouse (as cited in Weiten, 2000) an age-related decline in the capacity of working memory underlies adults' poorer performance on memory tasks. He attributes most of the decline in working memory to age-related decreases in the raw speed of mental processing. Although mental speed declines with age, problem-solving ability remains largely unimpaired if older people are given adequate time to compensate for their reduced speed (Weiten, 2000).

The implications of this and studies like that of Ng and Feldman (2008), which found that age is largely unrelated to training performance ($r = - 0.4$) include that slower paced training programmes could be more effective for older employees. However, due to the significant increase in costs that this will bring about, it may not be practically feasible.

In summary, it can be said that a negative relationship exists between training performance and age. Reasons for this relationship include that older employees are less motivated to participate in training programmes. Furthermore, training opportunities for older employees are limited due to the fact that older people learn slowly and offer a lower return on investment.

2.5.2 Gender

It is relatively clear that a strong relationship exist between training performance and gender, with males' training performance being higher than that of females. Researchers have examined reasons for this and in part attribute the specific relationship to issues such as training opportunities (Renaud et al., 2006) and/or women's role in family structures (Mandela, 1993).

Gender discrimination has been reported to exist in South African workplaces (Bowen, Cattell, Distiller & Michell, 2007) and the South African government has passed various policies and legislation to promote gender equity (Mafunisa, 2006).

In general, men are seen to receive more training from their employers than female workers (Renaud et al., 2006; Paulson-Gjerde, 2002). Females are also thought to hold a disadvantaged position in the academia, with the inequality possibly resulting from different training experiences encountered by female and male students or women's disproportionate representation in two-career families (Wong & Sanders, 1983).

In Africa, especially, there are great disparities in male and female educational levels because of the belief that women's education is not considered cost-effective (Annan-Yao, 2004). Gordon (as cited in Neno, 2007), for example, states that traditional law in Africa approves gender relations that guarantee male control and superiority over women. African family roles often determine that females are responsible for the children and/or housekeeping duties and, hence, do not need formal education (Mandela, 1993). In addition, socio-cultural constraints like early marriages, teenage pregnancies and some initiation rites inhibit females from continuing in school or attaining the highest possible educational level (Annan-Yao, 2004). In terms of Bloom's taxonomy of educational objectives, the above means that females will not encounter situations where the application of knowledge is required.

With regards to actual training performance, Klein, Astrachan and Kossek (1996) suggested that women might have more role difficulty functioning in a male-oriented training situation. Furthermore, in terms of the knowledge component of Bloom's taxonomy of educational objectives, a study by Vermeer, Boekarts and Seegers (2000) found that boys perform better than girls when it comes to complex mathematical

applied problem solving. Although girls showed a higher persistence during the applied problem solving, the difference in performance was explained by girls' lower confidence in this regard; girls attributed bad results to a lack of capacity and difficulty of task, more often than boys did (Vermeer et al., 2000).

In another study examining gender-related differences and test scores it was found that males performed moderately better on Physics, Chemistry, and Computer Science tests, with females having a slight advantage on language examinations (Stumpf & Stanley, 1996). Fennema and Peterson (as cited in Skaalvik, 1990) suggested that the gender differences in math and verbal achievement could be attributed to sex stereotypes and differential sex role socialisation patterns.

In summary, the relationship between training performance and gender can be seen as one in which males' training performance is higher than that of females. Reasons for this relationship include that males receive more training opportunities than females. Furthermore, socio-cultural constrictions and sex role perceptions limit females' participation in educational activities.

2.5.3 Educational level

A significant relationship seems to exist between training performance and educational level. Reasons for this have been investigated, with some research attributing it to issues such as training motivation (Wagner & Flannery, 2004) and/or training opportunities (Renaud et al., 2006).

According to Howe (as cited in Megginson et al., 1993), learning is cumulative i.e., people's capacity to learn more and different things is influenced by previous learning.

Furthermore, people's educational level is seen to hold a direct relationship with their intentions to partake in future training courses (Wagner & Flannery, 2004). The latter supports the notion that educational level is related to training motivation (Chiaburu & Tekleab, 2005).

Research findings also suggest that education was a very important factor in obtaining a job opportunity (Nasser & Abouchdid, 2005). Academic achievement is, for example, considered to be a key factor of the selection process in an accounting

environment (Gammie, 1996). In addition, empirical evidence has consistently shown that more highly educated workers are more likely to receive training from their employers (Renaud et al., 2006).

In terms of training performance per se, Athanasou (2001) found that completion of the highest level of secondary schooling of Australian school leavers ($N = 726$) had a profound impact on achievement of degree and diploma qualifications. Similar research studies have produced findings that undergraduate grades are significantly related to overall course performance ($r = 0.21$) in, for example, online distance learning courses (Alstete & Beutell, 2004).

Longitudinal studies have found that higher level of education was significant predictors of administrative - ($r = .22$) and cognitive abilities ($r = .43$) (Howard, 1986). With reference to Bloom's taxonomy of educational objectives, comparable research has found that adults' educational level affected their ability to evaluate their comprehension during reading; i.e., adults with more education performed better than adults with less education (Zabrucky, Moore & Schultz Jr., 1987).

The relationship between training performance and educational level should also be considered in the form of a process. It has been suggested, for example, that educational experiences over time influence the development of verbal and mathematical reasoning abilities (Brody & Benbow, 1990).

Devanney (2009) recognise this process when she states that employers should be sensitive to people's previous educational experiences and social context when they encourage participation in education-based work. Lower educated people may experience several barriers, which complicate educational participation; they may experience obstacles such as lack of self-confidence, negative attitude, lack of money and suitable provisions (Van der Kamp & Scheeren, 1997).

A detailed understanding of people's social context and previous educational experiences are especially relevant in South Africa, as differential access to education across race groups was one of the defining features of apartheid South Africa (Dias & Posel, 2007). During the apartheid period, the aggregate amount spent on education for the African majority was much less than the aggregate amount spent on

the white minority (Seekings & Nattrass, 2005). This, in part, resulted in poor teaching in historically black schools (Huysamen, 2000). These events are bound to affect the relationship between training performance and education qualification in an unusual way; as was proved in research findings of poor correlations between matriculation performance and first-year performance for black South African matriculants (Huysamen, 2000).

In summary, the relationship between training performance and educational level can be seen as one in which people with higher educational levels will achieve higher training performance. Reasons for this relationship includes that people with higher educational levels receive more training opportunities and have higher training motivation. Furthermore, lower educated people may experience social obstacles, which may affect their educational participation.

2.6 Conclusion: Chapter 2

Researchers have examined the relationship between biographical variables (e.g., age, gender and educational level) and performance on training programmes. Based on this literature study, the substantive research question for the present research could be formulated as follows:

“Do learners’ biographical characteristics affect their performance on learnership opportunities and, if so, how do they do so individually and jointly?”

Research results have shown that a negative relationship appears to exist between training performance and age. Furthermore, males are thought to achieve higher training performance than females and people with higher educational levels are normally expected to achieve higher training performance.

The hypothesised relationships between the various predictors chosen for this study and the criterion measure are depicted in Figure 2.1.

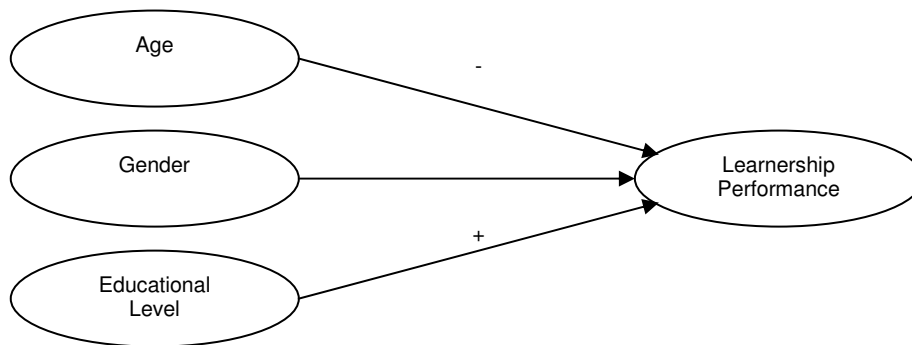


Figure 2.1: Hypothesised relationships between independent variables (Age, Gender & Educational Level) and dependent variable (Learnership Performance).

These suggested interrelationships between learner biographical characteristics (bio-data) and learnership performance scores should be investigated in the South African context in order to identify factors that could potentially help HRD practitioners to manage the success of learners in learnership programmes more effectively. In the next chapter, the research method that was followed to achieve this objective is discussed.

CHAPTER 3: RESEARCH METHOD

3.1 Introduction

As discussed in chapter 1, the intention of the study was to investigate the relationship between individuals' demographic characteristics and their learnership performance. The study also aimed to improve comprehension of the relationship between individuals' demographic characteristics and their learnership performance and to identify related factors that may influence individuals' learnership performance. This chapter will focus on the research methodology used in the study to achieve the objectives that were set out in chapter 1. The chapter will start off by discussing the research design chosen for the study and the reasons why this research design was selected. The discussion of the research design will be followed by presentation of the formulated hypotheses, which would act as foundation for the study, and the attributes of the research sample used. The various measures, and data collection procedures, used in the study will be discussed in the penultimate section of this chapter. The chapter concludes by describing the methodology used in analysing the collected data.

3.2 Research design

A research design is a plan of how the researcher intends to conduct the research; it focuses on the kind of study that is being planned and the kind of results that is aimed for (Mouton, 2001). The research design utilised in this study was a combination of the quantitative- and qualitative research designs. A combination of designs were selected, because the researcher felt that it would provide the best means of achieving the aim of the study, which was to improve the understanding of researchers and practitioners of the relationship between individuals' demographic characteristics and their learnership performance.

The quantitative research approach was used to test a range of hypotheses that were formulated to predict the relationships between the independent variables (i.e., age, gender, and educational level) and the dependent variable (i.e., learnership performance). Furthermore, a qualitative research component, utilising basic

individual interviews as research instrument, was utilised to support, and provide further clarity on, the results of the quantitative component of the research study.

The qualitative research component, which was exploratory in nature and, hence, limited in scope ($N = 20$), allowed for more in-depth investigation of the relationship between individuals demographic characteristics and their learnership performance, as it also took into account the social context(s) in which learnerships are presented (Neuman, 1997). In summary, a combination of the quantitative and qualitative research designs appeared to be the most effective way in which to address the aim of the study.

The quantitative research component made use of an *ex post facto* correlational research design to investigate the relationship between the variables. Features of an *ex post facto* research design include that it seeks the solution of a problem through the analysis of data (Leedy, 1989) and that it is mainly used by researchers to describe observations rather than present treatments (Patten, 2004). Although a common disadvantage of the *ex post facto* research design is that it involves the development of hypotheses that will predict a relationship between two variables that have already been observed (Babbie & Mouton, 2001) it is still seen as a powerful scientific tool that, when used properly, may provide data on many important scientific issues (Patten, 2004). In addition, a *correlational* research design was chosen for the study, since it is the main research design that researchers use when they seek to determine the relationship between some predictor variables and criterion variables (McCormick & Igen, 1980). Implementing the *correlational* research strategy to investigate learnerships seemed especially appropriate, as it is a research design that is often associated with preliminary work in an area that has not received a lot of research attention (Gravetter & Forzano, 2006). Although correlational studies are normally seen to have high external validity, it is also characterised by having low internal validity (Gravetter & Forzano, 2006). The latter can, in part, be attributed to the third-variable problem (i.e., a third variable is producing observed relation between two variables) and/or the directionality problem (i.e., strategy does not determine which of the related variables is the “cause” and which is the “effect”) (Gravetter & Forzano, 2006). The research data for the quantitative component of the study consisted of secondary data, which was utilised to conduct a study that was multivariate in nature,

and involved a set of independent variables and a single dependent variable. The data was collected over a period of three years (2006-2008) and included information from different candidates and different year-groups. Advantages of secondary data include that it is easier to use and tends to be more comprehensive, reliable and valid than primary data. In addition, secondary data are often available in large samples, well beyond the resources of the individual researcher, allowing the researcher to concentrate on data analysis and interpretation (Adams, Khan, Raeside & White, 2009). In contrast, it should be stated that the disadvantages of secondary data involve issues such as data coverage; i.e., the information often does not cover all subjects or groups in the research, and data quality, i.e., it is important to assess and consider the authenticity of the data and the data source (Adams et al., 2009).

To summarise, the study intended to investigate the relationship between individuals' demographic characteristics and their learnership performance. The study also aimed to provide more clarity on the relationship between individuals' demographic characteristics and their learnership performance by identifying related factors that may influence individuals' learnership performance. It was decided that a combination of the quantitative and qualitative research designs be used to achieve the aim of the study. The quantitative research component utilised an *ex post facto* correlational research design, while basic individual interviews were used in the qualitative part of the study. The quantitative research data was subjective in nature. Having addressed and substantiated the nature of the research design that was used in the study, the various hypotheses that was formulated are consequently discussed.

3.3 Hypotheses

Kerlinger (1986) defined an hypothesis as a conjectural statement of the relation between two or more variables. The necessity of hypotheses lies in the fact that researchers need to have some point around which their research can be oriented when searching for relevant data and in establishing a tentative goal against which to project the data (Leedy, 1989). Hypotheses are always in declarative sentence form, and they relate, either generally or specifically, variables to variables (Leedy, 1989).

In the case of this study the objective was to investigate the relationship between individuals' demographic characteristics and their learnership performance. A

literature study was conducted to investigate the predictor variables (i.e., age, gender, and educational level) and the dependent variable (i.e., learnership performance) involved. Detail obtained in the literature study was reported in chapter 2. Based on the literature review, a conceptual framework was developed to illustrate the hypothetical relationships between the predictor variables and the dependent variable (see Figure 3.1). It was expected that the demographic factors will each have a statistically significant relationship with learnership performance, and hence, a hypothesis was formulated for each predictor variable, with each hypothesis being a directional hypothesis.

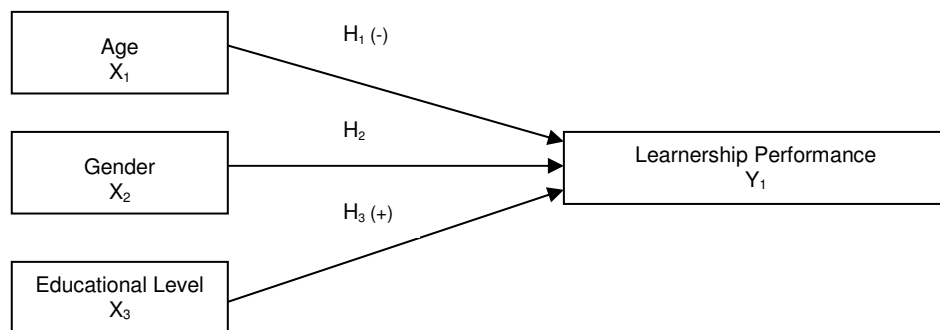


Figure 3.1: Conceptual Framework to Illustrate Hypothetical Relationships between Independent Variables (Age, Gender & Educational Level) and Dependent Variable (Learnership Performance).

In addition to the directional hypotheses, we expected that, when included in a regression model, the predictor variables would each explain unique variance in the criterion. The following regression model was subsequently tested, with the outcome variable “Learnership Performance” represented by “ Y_i ”, and “ b_1 ”, “ b_2 ”, “ b_3 ” representing the coefficients of the predictors “Age”, “Gender”, and “Educational Level” respectively. No relationships were anticipated among the predictor variables.

$$Y_i = a + b_1X_1 + b_2X_2 + b_3X_3 + \varepsilon_i$$

Based on the literature review and line of reasoning described above, the following hypotheses were developed to assist the researcher in achieving the objectives of the research study.

Hypothesis 1:

Conclusions drawn from the literature review about the relationship between age and learnership performance suggested that a negative relationship exists between learnership performance and age. Charness et al. (2001), for example, stated that older employees learn slowly. Similarly, Newton (2006) found that older people are less motivated to participate in training programmes and Ng and Feldman (2008) suggest that older people offer a lower return on investment for companies investing in training activities. Based on these and similar arguments detected in the literature review, the following hypothesis was formulated:

A statistically significant negative relationship exists between a learner's age and his/her learnership performance.

$$H_0: \rho[X_1, Y_1]=0$$

$$H_a: \rho[X_1, Y_1]<0$$

Hypothesis 2:

The literature review proposes that the relationship between learnership performance and gender is one in which males' learnership performance is higher than that of females. This proposition is for example illustrated in findings such as that of Renaud et al. (2006), which states that females receive less training opportunities than males. In addition, the literature review suggests that females' participation in educational activities is often limited by socio-cultural constrictions (Annan-Yao, 2004) and sex role perceptions (Mandela, 1993). Based on these thoughts, the following hypothesis was formulated:

Learnership performance will, on average, be significantly higher for males, such that the relationship between gender and learnership would be positive when males are coded as 1 and females as 0.

$$H_02: \rho[X_2, Y_1]=0$$

$$H_{a2}: \rho[X_2, Y_1]>0$$

Hypothesis 3:

In terms of the relationship between learnership performance and educational level, the literature review proposes that the relationship between learnership performance and educational level could be seen as one in which people with higher educational levels will achieve higher learnership performance. This observation was partly attributed to ideas that people with higher educational levels receive more training opportunities (Renaud et al., 2006). In addition, people with higher education qualifications are thought to have higher training motivation (Wagner & Flannery, 2004) and are seen to experience fewer social obstacles to educational participation (Devanney, 2009). The afore-mentioned arguments led to formulation of the following hypothesis:

A statistically significant positive relationship exists between learnership performance and educational level.

$$H_03: \rho[X_3, Y_1]=0$$

$$H_{a3}: \rho[X_3, Y_1]>0$$

In addition to examining the relationship between the predictor variables and the dependent variable, the study also aimed to establish how much unique variance in the criterion each predictor variable would explain when included in a regression model. As a result, a regression model with learnership performance as the outcome variable and age, gender and educational level as the predictor variables were developed. In an attempt to answer the question of how much unique variance in the criterion each predictor variable would explain when included in a regression model, the following hypotheses were generated to test the devised regression model.

Hypothesis 4:

A learner's age (X₁) explains unique variance in learnership performance (Y₁) when included in a regression model already containing measures of gender (X₂) and educational level (X₃).

$$H_{04}: -\beta[X_1] = 0 | -\beta[Y_1] \neq 0$$

$$H_{a4}: -\beta[X_1] > 0 | -\beta[Y_1] \neq 0$$

Hypothesis 5:

A learner's gender (X₂) explains unique variance in learnership performance (Y₁) when included in a regression model already containing measures of age (X₁) and educational level (X₃).

$$H_{05}: \beta[X_2] = 0 | \beta[Y_1] \neq 0$$

$$H_{a5}: \beta[X_2] > 0 | \beta[Y_1] \neq 0$$

Hypothesis 6:

A learner's educational level (X₃) explains unique variance in learnership performance (Y₁) when included in a regression model already containing measures of age (X₁) and gender (X₂).

$$H_{06}: \beta[X_3] = 0 | \beta[Y_1] \neq 0$$

$$H_{a6}: \beta[X_3] > 0 | \beta[Y_1] \neq 0$$

In summary, six hypotheses were formulated to assist the researcher in investigating the relationship between individuals' demographic characteristics and their learnership performance. Three directional hypotheses were formulated to explore the relationship between the predictor variables (i.e., age, gender, and educational level) and the dependent variable (i.e., learnership performance). In addition, three further hypotheses were developed to examine how much unique variance in the criterion each predictor variable would explain when included in a regression model. This section provided a presentation of the hypotheses that were formulated for this

research study. A discussion of the research participants that took part in the study will be discussed next.

3.4 Sample of research participants

The sample for the study consisted of learners who completed the learnership programme (i.e., National Certificate: Fruit Packing and Grading Processes) during the years of 2006, 2007 and 2008. Data of 340 participants, from 27 companies, was available for the quantitative component of the study. Participants came from different geographical areas such as the Western Cape, Eastern Cape and Mpumalanga provinces respectively. The demographic profile of the sample is shown in Table 3.1. In terms of the qualitative component of the research study, a sample of 20 participants was randomly selected from three partaking companies in the Western Cape.

Quantitative research principles typically accept that the bigger the sample the better for the purposes of providing adequate statistical power for the statistical analysis of data (Field, 2005). As a result, the researcher looked to utilise data of as many participants possible (i.e., from historical records). It can therefore be said that the non-probability convenience sampling technique was used (Babbie & Mouton, 2001).

The research sample of 340 participants was overrepresentative of females and data of male ($n = 97$) and female participants ($n = 243$) were used. All of the participants were between the ages of 17y 9mths and 56y 11mths ($SD = 7.33$). With regards to the other variable of importance in the directional hypotheses, i.e., educational level, participants' educational level varied between Grade 6 and Grade 12. Other demographic information of the sample included characteristics such as race, home language, and work experience. In terms of race, 82.9% of the participants were coloured and 17.1% were black; no whites or Indians took part in the study. The home language of most of the participants (84.4%) was Afrikaans, while 12.6% of the participants' home language was Xhosa. Lastly, it can be reported that participants' work experience ranged from 1 year to 29 years (Mean = 7.81).

In conclusion, the researcher was happy that the compilation of the research sample would assist in achieving the objectives of the study to investigate the relationship between individuals' demographic characteristics and their learnership performance.

Although the sample was unequally distributed in terms of attributes like race and home language, the fact that participants came from different geographical regions provided for generalisation of results.

Table 3.1: Demographic Profile of the Sample

AGE		
VARIABLE	Mean	SD
Age	30y 4mths	7.33
GENDER		
RESPONSES	Frequency	%
Male	97	28.5
Female	243	71.5
EDUCATION		
RESPONSES	Frequency	%
Grade 6	3	.9
Grade 7	4	1.2
Grade 8	13	3.8
Grade 9	29	8.5
Grade 10	61	17.9
Grade 11	51	15.0
Grade 12	175	51.5
Not Specified	4	1.2
RACE		
RESPONSES	Frequency	%
Black	58	17.1
Coloured	282	82.9
LANGUAGE		
RESPONSES	Frequency	%
Afrikaans	287	84.4
Xhosa	43	12.6
Sotho	2	.6
Tsonga	6	1.8
Sepedi	2	.6
WORK EXPERIENCE		
VARIABLE	Mean (years)	SD
Work Experience	7.81	5.625

Note. $N = 340$

3.5 Measures

With the purpose of investigating the relationship between the predictors and the criterion, as well as examining the amount of unique variance each predictor caused in

the criterion, six hypotheses had to be tested statistically. For that reason, the variables relevant to the study had to be operationalised. Various measures were used for operationalising the variables studied in this research project. All these measures took the form of historical data that were retrieved from training records. These measures will be discussed in more detail in the next sections.

3.5.1 Learnership Performance

The dependent variable in the study, Learnership Performance, was operationalised by means of objective data obtained from a whole series of assessments on the learnership qualification, *National Certificate: Fruit Packing and Grading Processes*. The qualification is registered at level 3 on the National Qualification Framework and consists of a total of 126 credits (see appendix A). Learnership Performance was measured by obtaining the test scores, i.e., subjective ratings of training performance, of various theoretical assessments for the qualification and creating a single composite score for each participant. Single composite test scores for the whole qualification were calculated by creating a linear composite of the measures of Learnership Performance.

Table 3.2: Calculation of single composite test score by creating a linear composite of measures of Learnership Performance.

Unit Standard	Test Marks Total	Test Marks Obtained (Individual 1)	Test Marks Percentage Obtained (Individual 1)
Unit Standard 1	30	20	66.67%
Unit Standard 2	30	20	66.67%
Unit Standard 3	35	25	71.43%
Unit Standard 4			
Unit Standard 5	25	20	80%

A composite of the measures of Learnership Performance for this example follows:

3.5.1.1 Learnership Performance for Individual 1:

$$\begin{aligned}
 \text{Learnership Performance} &= (66.67 + 66.67 + 71.43 + 80)/4 \\
 &= (66.67 + 66.67 + 71.43 + 80)/4 \\
 &= 71.19\%
 \end{aligned}$$

Although it was also an option to calculate Learnership Performance for fundamental, core and elective unit standards as subcategories of performance it was deemed that a single composite score for the total national qualification would give the best indication of overall relative performance on the series of performance dimensions. In addition, it was expected that the overall performance measure would highly correlate with the sub categories and therefore, would measure approximately the same item. Consequently, attention was only given to participants' single composite scores for the whole qualification, and to how biographical predictors are related to it.

It was deemed that the control measures in this study would ensure that comparable reliability of measurement is achieved. The validity of the learnership performance measure was assessed by convergent validity analysis between the sub-facets of the performance criterion, i.e., the intercorrelations between the three measures were assessed. High intercorrelations provided support for forming the composite measure for the variable Learnership Performance.

3.5.2 Age

The predictor variable "Age" was operationalised by utilising the "date of birth" information as provided on the "Learnership Information Form" (see appendix B). Participants' age was reflected in years and months. A participant's age was calculated based on the date on which he/she started the learnership training programme.

3.5.3 Gender

The predictor variable "Gender" was a response on a choice between male and female. Male was coded as one and female was coded as two in the data set.

3.5.4 Educational Level

The predictor variable "Educational Level" was operationalised by utilising the "highest qualification" information as provided on the "Learnership Information Form" (see appendix B). The relevant qualification was expressed in terms of school grade-level completed and ranged from grade-level 6 to grade-level 12.

3.6 Procedure

As pointed out in the introductory section of this chapter, a combination of quantitative and qualitative research designs were utilised for the purposes of addressing the objectives of this study. Different procedures were involved in the quantitative and qualitative research components and hence, the discussion of the procedure(s) used will be presented in two separate categories.

3.6.1 Quantitative research design

The main aim of the quantitative component of the study was to investigate the relationship between individuals' demographic characteristics and their learnership performance by testing three directional hypotheses and three hypotheses examining how much unique variance in the criterion each predictor can account for. Various elements of information constituted the data for this component of the study, such as demographic information and learnership performance scores of learners who completed the learnership (National Certificate: Fruit Packing and Grading Processes) during 2006, 2007 and 2008. The data was obtained from an accredited training provider who presented the National Certificate: Fruit Packing and Grading Processes learnership during 2006, 2007 and 2008. Once permission to use learner data had been attained, each learner's biographical information (i.e., Age, Gender and highest Educational Level) was obtained from the learner 'biographical form' included in each learner's portfolio of evidence (see appendix B). The information was used to compile learner profiles. Learner names were not mentioned and all the information used was treated as confidential.

The learner profiles was numbered for identification purposes and categorised according to the year in which the learnership was completed. Since we were using historical data and maintaining anonymity, informed consent was not deemed to be applicable. After the learner profiles were compiled, the test scores of all the participants, on all the unit standards, were obtained.

The test scores were allocated to the corresponding learner profiles and grouped according to fundamental -, core -, and elective unit standards. Once all the test scores were allocated to the corresponding learner profiles and grouped according to fundamental -, core -, and elective unit standards, a single composite test scores for

the whole qualification were calculated for each learner. The latter was done by creating a linear composite of the measures of learnership performance as described in section 3.5.1. The composite test scores were used in the statistical analyses (see section 3.7) to test the formulated hypotheses.

3.6.2 Qualitative research design

In addition to the quantitative component, the research study also included a supplementary qualitative design phase. The aim of the qualitative part of the study involved improving the comprehension of the relationship between individuals' demographic characteristics and their learnership performance. It also set out to identify related factors that may influence individuals' learnership performance. The qualitative research instrument of basic individual interviews were utilised to assist in addressing the stated objectives. In terms of procedure used during the basic individual interviews, the following seven stages of Steiner Kvale (as cited in Babbie & Mouton, 2001) were followed:

1. Clarifying the purpose of the interviews and the concepts to be explored.
2. Designing the process through which to accomplish the purpose, including a consideration of the ethical dimension.
3. Interviewing: doing the actual interviews
4. Transcribing: writing a text of the interviews
5. Analysing: determining the meaning of gathered materials in relation to the purpose of the study.
6. Verifying: checking the reliability and validity of the materials
7. Reporting: telling others what you have learned

A combination of 'purposive sampling' and 'convenience sampling' was used to select participants for the interviews. Purposive sampling was used to select three organisations in the Western Cape where the learnership, National Certificate: Fruit Packing and Grading Processes (NQF3) were presented in 2006, 2007 or 2008. The geographical location of the three organisations provided the researcher with easier, and more cost-effective, access to respondents. Purposive sampling is appropriate to select members of a difficult-to-reach, specialised group (Neuman, 1997). Once the client organisations were identified, respondents for the interviews were selected by

using the SPSS functions ‘random’ and ‘select’ to randomly select twenty (20) respondents.

With regards to the interviews itself, Babbie and Mouton (2001) state that a basic individual interview is one of the most frequently used methods of data gathering within the qualitative approach. Basic individual interviews differ from most other interviews in that it is an open interview which allows the participant to speak for him/herself rather than answer a battery of predetermined hypothesis-based questions (Babbie et al., 2001). The following questions were used to establish a general direction for the interview:

- “How did you experience the learnership?”
- “Share with me the obstacles that you experienced during the learnership and everything that went along with it?”
- “What factors would you say helped you to perform well on the learnership?”

The ethical dimension of the interview was considered and a completed ‘informed consent’ form (see appendix C) was obtained from every respondent prior to the interview.

The actual interviews were conducted on-site at the workplace of the learners. The interview proceeded through several stages as proposed by Neuman (1997), beginning with an introduction and entry. The interviewer showed authorisation, reassured participants and secured cooperation from the respondents. The interviewer was prepared for reactions such as, “How did you pick me?” “What good will this do?” and explained why the specific respondents were interviewed. The main part of the interview consisted of asking questions and recording answers. The interviewer used the exact wording of the questions mentioned earlier. The interviewer asked all the questions in the same order and conducted the interview at a comfortable pace. In addition to asking the questions, the interviewer accurately recorded answers. He listened carefully and recorded what was said without correcting grammar or slang. The interviewer attempted not to summarise or paraphrase answers, because it may cause a loss of information or distorts answers. Probes were used to get answers in more depth without biasing later answers. A probe is a neutral request to clarify an ambiguous answer, to complete an incomplete answer, or to obtain a relevant

response. There are many types of probes. Examples of probes used during the interviews included three – to five-second pauses, nonverbal communications (e.g., eye contact), repeating questions and asking neutral questions. Examples of neutral questions used include, “Any other reasons?” “Can you tell me more about that?” “How do you mean?” “Could you explain more for me?”.

The last stage of the interview is called the ‘exit’ and involved the interviewer actions of thanking the respondent and leaving (Neuman, 1997). After the ‘exit’ the interviewer went to a quiet, private place to edit the notes taken during the interview and recorded other details while they were still fresh. Other details included the date, time, and place of the interview; a thumbnail sketch of the respondent and interview situation; the respondent’s attitude (e.g., serious, angry, laughing); and any unusual circumstances. The interviewer also noted anything disruptive that happened during the interview and accurately recorded answers by taking notes during the actual interview. The notes were neat and organised, as the researcher returned to them over and over again. Once written, the notes were treated with care and confidentiality, respondents remained anonymous, and the researcher made use of allocated numbers to distinguish between participants’ feedback.

3.7 Statistical analysis

The quantitative research data was initially analysed by making use of descriptive statistics (e.g., percentages, frequency counts, graphs, etc.), followed by inferential statistics to assist in supporting or rejecting the inferences made in the formulated hypotheses.

Simple (zero-order) Pearson product-moment correlation coefficients and point biserial correlation coefficient (r_{pb}) (for nominal-level predictors, e.g., gender) were used to test H_{01} to H_{03} . Standard multiple regression analysis (Cohen, Cohen, West & Aiken, 2003) was used to test H_{04} to H_{06} . The essence of multiple regression analysis is predicting some kind of outcome from several predictor variables (Field, 2005). An attempt was made to find the linear combination of predictors that correlates maximally with the outcome variable. The collected values for the outcome variable (Learnership Performance) and the predictor variables (Age, Gender, and Educational Level) were entered into the equation in order to

calculate the unknown parameters. When the predictor variables were entered into the regression model, most were discrete variables (e.g., men = 1; women = 2) and not continuous variables. The unknown parameters were calculated, by fitting a model to the data for which the sum of squared differences between the actual data and the linear model (i.e., line) was minimised. In other words, the method of least squares was used to calculate the regression line, which is the line with the lowest sum of squared differences (SST) (Field, 2005).

The inaccuracy that was still present after the best model was fitted to the data was represented by the residual sum of squares (SSR) (Field, 2005). The difference between SST and SSR was calculated to determine how much better the regression line (i.e., line of best fit) was than the basic model. The reduction in inaccuracy (i.e., improvement) due to fitting the regression line is the model sum of squares (SSM). If the SSM is large, the regression line made a big improvement; if the SSM is small, the regression line made little difference (Field, 2005).

The multiple correlation coefficient (*Multiple R*) as produced by SPSS was assessed to determine how well the model fitted the data. The *Multiple R* is a correlation between the observed values of Y and the values of Y predicted by the multiple regression model (Field, 2005). A large *Multiple R* indicates a large correlation between the above-mentioned, while a *Multiple R* of 1 indicates that a model perfectly predicts the observed data (Field, 2005).

In addition to the above-mentioned the question of whether the model was influenced by a small number of cases was addressed by attempting to identify outliers by looking for big residuals. In order to identify a “cut-off” point for “large residuals”, we used standardised residuals (i.e., convert residuals to z-scores). Residuals with an absolute value higher than 3.29 was seen to be a concern (Field, 2005).

Bivariate scatterplots were investigated for every predictor variable and criterion measure in an attempt to determine whether non-linear relationships exist.

Lastly, the issue of collinearity was addressed by scanning a correlation matrix of all the predictor variables to see if any correlate very highly. Collinearity exists when there is strong correlation between two or more predictors in a regression model

(Field, 2005). No problems were experienced in this regard, as predictors were mainly unrelated.

Congruent with the fact that the research process is based on probabilities, Fisher's probability value (ρ) of .05 was used as benchmark to determine whether or not findings were statistically significant (Field, 2005). If ' ρ ' was found to be smaller than .05, it was accepted that the test statistic is large because our model explains enough variation to reflect what is happening in the real world. In such a situation, we accepted the experimental hypotheses and rejected the null hypotheses (Field, 2005).

In contrast, if the test statistic was calculated and ' ρ ' was found to be larger than .05, the experimental hypotheses were rejected and the finding was seen as non-significant (Field, 2005). In a situation where ' ρ ' was found to be smaller than .05, Pearson's correlation coefficient as a measure of effect size was calculated to assist in determining whether we have made either a Type 1 or Type 2 error during our analysis. If the probability of making a Type 1 error (α) was less than .05 and/or the probability of making a Type 2 error (β) was less than .2, an effect was accepted as statistically significant (Field, 2005).

The convention proposed by Cohen (1988), and depicted in Table 3.3, was in the present study used to interpret the magnitude of the correlation coefficients.

Table 3.3: Cohen's Interpretation of the Magnitude of Significant r

Correlation	Negative	Positive
Small	-0.3 to -0.1	0.1 to 0.3
Medium	-0.5 to -0.3	0.3 to 0.5
Large	-1.0 to -0.5	0.5 to 1.0

3.8 Analysis of qualitative results

In terms of analysing the results obtained in the qualitative research component, which aimed to improve the comprehension of the relationship between individuals' demographic characteristics and their learnership performance, as well as identifying related factors that may influence individuals' learnership performance. Information obtained during the basic individual interviews was analysed by making use of 'qualitative coding' (Neuman, 1997). Neuman explains that qualitative coding

involves organising the raw data into conceptual categories and creating themes or concepts, which will assist the researcher to further analyse the data. Qualitative data were analysed by utilising the three different phases of qualitative coding as defined by Strauss (as cited in Neuman, 1997), i.e., open coding, axial coding, and selective coding. Open coding was performed first and mainly involved reading through all the information and locating common themes in the data. The creation of categories allowed for easier comparison to findings obtained in the quantitative component of the study. Categories were created by thinking about the comments, by exchanging ideas with a colleague, and by referring to research literature on the subject(s). Initial codes were subsequently allocated to the different themes identified. The classification of themes helped us to start the second phase of coding, i.e., the axial coding, with an organised set of codes or concepts. During the axial coding, we considered aspects such as possible causes and consequences, conditions and interactions, and looked for categories or concepts that can be clustered together. After conclusion of the axial coding phase, a final coding phase, called selective coding, was conducted. During this phase, the researcher looked selectively for cases that illustrated themes and made comparisons and contrasts after all data collection were complete. During selective coding, major themes or concepts ultimately guide the researcher's search (Neuman, 1997).

With respect to verification, a subject matter expert was asked to assist in verifying the reliability and validity of the interview process and the materials obtained. The reliability of field data addresses the question: Are researcher observations about a member or field event internally and externally consistent? Internal consistency refers to whether the data are reasonable given all that is known about a person or event, whereas external consistency is achieved by verifying or cross-checking observations with other, different sources of data (Neuman, 1997).

Validity in field research is the confidence placed in a researcher's analysis and data as accurately representing the social world in the field (Neuman, 1997). The validity of the information obtained during the interviews was evaluated by using the test of research accuracy known as 'natural history'. 'Natural history' is a detailed description of how the project was conducted (Neuman, 1997). A full disclosure of the researcher's actions, assumptions, and procedures are provided in the study for

others to evaluate. A project is valid in terms of natural history if outsiders see and accept the field site and the researcher's actions (Neuman, 1997). Qualitative researchers have moved toward presenting summaries of their data analysis in the form of tables, diagrams and charts (Neuman, 1997). Tables and diagrams were used to organise ideas and communicate results to readers. The conclusions drawn from the interviews are presented in Chapter 4.

3.9 Conclusion: Chapter 3

Chapter 3 discussed the research design used in the study. A combination of quantitative- and qualitative research designs were used to address the aim of the study, which in broad terms was to improve comprehension of the relationship between individuals' demographic characteristics and their learnership performance. The quantitative research component made use of an *ex post facto* correlational research design and involved the formulation of hypotheses. Three hypotheses were formulated to investigate whether the predictors (i.e., Age, Gender, and Educational Level) each had a statistically significant relationship with the criterion (i.e., Learnership Performance). In addition, three further hypotheses were developed to examine how much unique variance in the criterion each predictor variable would explain when included in a regression model. After presentation of the hypotheses, the demographic profile of the participant sample was described. The research sample used in the study comprised learners who completed the National Certificate: Fruit Packing and Grading Processes NQF3 learnership during 2006, 2007, and 2008 (quantitative component $N = 340$; qualitative component $N = 20$). The measures used to operationalise the criterion and predictor variables were explained prior to presentation of the administration procedure and discussion of the statistical analysis techniques used. With regards to the qualitative component, basic individual interviews were presented as qualitative data gathering instrument and the procedure for collecting and analysing the qualitative data were presented. A description of the results obtained from both the quantitative and qualitative components are presented in the next section, i.e., Chapter 4.

CHAPTER 4: PRESENTATION OF RESEARCH RESULTS

4.1 Introduction

The research study proposed several hypotheses regarding the relationship between individuals' demographic characteristics and their learnership performance. Various statistical techniques were employed to investigate these hypotheses and hence, to analyse the relationships between the constructs and the degree to which the independent variables predicted variance in the dependent variable. The statistical techniques used were discussed in chapter 3 while the results of the analyses will be discussed in this chapter.

In addition to the above, a qualitative component was added to the study to confirm, and provide further clarity on, the results of the quantitative section. It was hoped that the qualitative research technique of basic individual interviews might help us to obtain information that would improve our understanding of the relationship between individuals' demographic characteristics and their learnership performance. Similarly, it was anticipated that the qualitative results might identify new and additional factors that also influences individuals' learnership performance.

The aim of this chapter is to present the results of the statistical analyses as well as the basic individual interviews. This chapter is divided into sections for quantitative and qualitative results. The quantitative section will start off with an overview of the descriptive statistics, followed by a detailed discussion of the inferential statistical results. After that, the qualitative part will present findings in categories associated with the demographic characteristics (i.e., age, gender and educational level), and additional factors that might affect learnership performance respectively.

4.2 Quantitative Results

4.2.1 Descriptive Statistics

The first step in the statistical analyses involved calculating the descriptive statistics of the predictor and criterion variables (see Tables 4.1 – 4.3). Descriptive statistics

describe samples of subjects in terms of variables or combinations of variables and serve to summarise the data in research investigations (Tabachnick & Fidell, 1996). Analysis of the descriptive statistics is discussed and presented next.

Prior to analysis, the variables Age, Gender, Educational Level and Learnership Performance were examined through various SPSS programs for accuracy of data entry, missing values, and fit between their distributions and the assumptions of correlation, regression and ANCOVA. To make the data more understandable, the values for Age were changed to 'year' values. The poor split on Gender (243 females to 97 males) probably lowered its correlations with other variables (Field, 2005), but it was retained for analysis. A coding error was identified for the Educational Level variable and a category added for cases where participants neglected to specify their highest educational level. In an attempt to improve the normality, the Educational Level variable were transformed, recoded and presented in three categories. Missing values for the Learnership Performance variable were spotted for 81 cases; these cases were subsequently deleted and reduced the final sample to 340 cases. Correlations were done between learnership performance on core -, fundamental - and elective unit standards and overall learnership performance. Results showed high correlations between the variables and it was decided to use overall Learnership Performance as the sole measure of the learnership performance variable. Eight residual outliers (two for Age, three for Educational Level and three for Learnership Performance) were identified with an absolute standardised residual greater than three. In order to obtain a more reliable regression analysis, these outliers were eliminated from further analyses (Field, 2005).

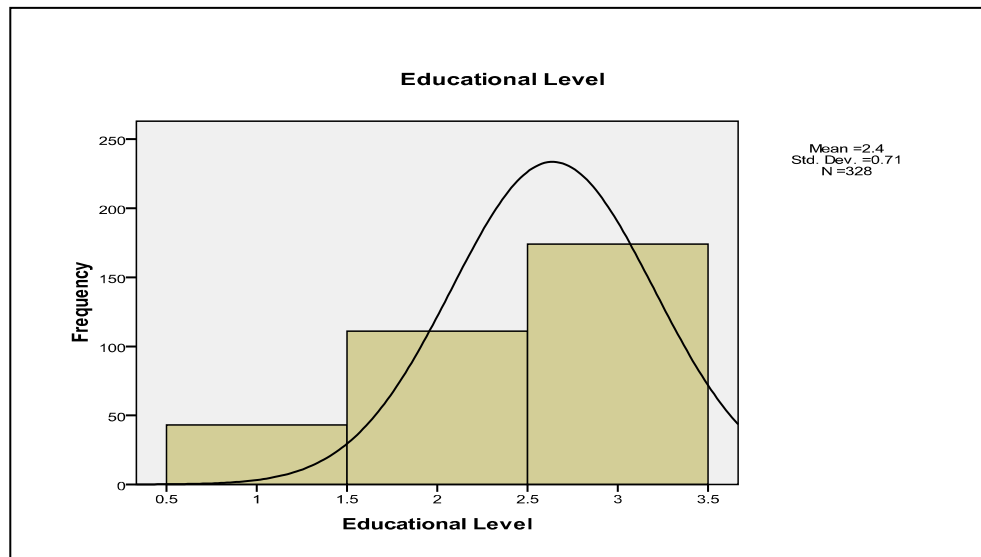


Figure 4.1: Frequency Histogram, with the normal distribution overlay, for the Educational Level Variable

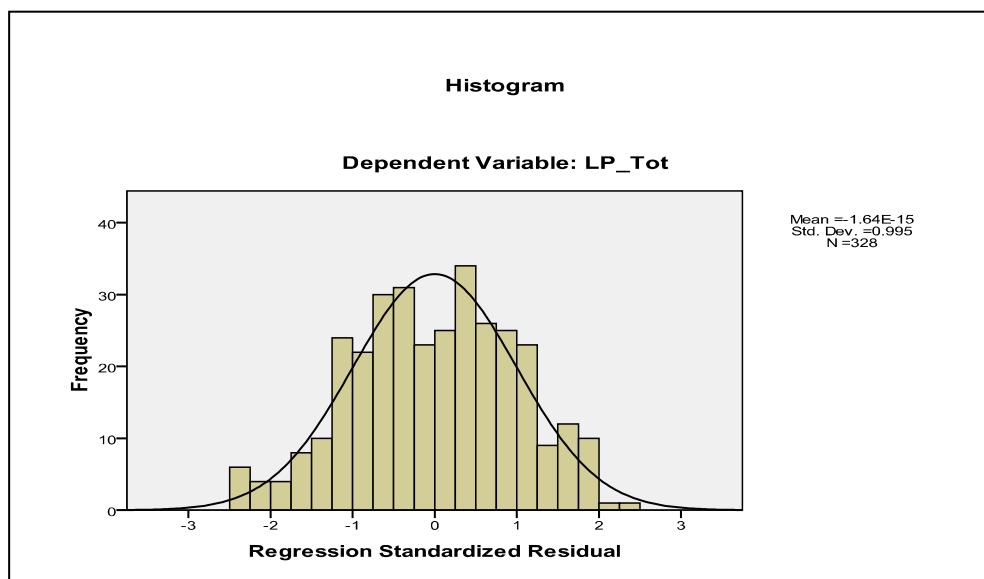


Figure 4.2: Frequency Histogram, with the normal distribution overlay, for the Learnership Performance Variable

In terms of normality, the skewness, kurtosis and overall normality were tested by calculating the skewness– and kurtosis statistics for each variable. Standardised skewness for Age ($z = 4.39$), Gender ($z = 7.22$) and Educational Level ($z = 5.56$) was significant at $p < 0.01$. The standardised skewness for Learnership Performance ($z = 1.84$) was not significant. In terms of kurtosis, Gender yielded a standardised kurtosis ($z = 4.01$), which was significant at $p < 0.01$. Standardised kurtosis for Age

($z = .76$), Educational Level ($z = 2.57$) and Learnership Performance ($z = 2.09$) were not significant. Both square root and log transformation for the Educational Level variable were performed in an attempt to improve normality. However, transformation failed to improve normality as judged by the standardised kurtosis values of the educational square root ($z = 4.16$). Although the skewness improved marginally, the null hypothesis that the scores were drawn from a normal distribution was still rejected and the transformations of the Educational Level variable were not retained. Tabachnick and Fidell (1996) point out that when working with large samples in a research study, it is a good idea to look at the shape of the distribution instead of using formal inference tests. The reason being that because standard errors for both skewness and kurtosis decreases with larger N , the null hypothesis is likely to be rejected with large samples when there are only minor deviations from normality (Tabachnick & Fidell, 1996). Frequency histograms, with the normal distributions as overlays, are presented in Figure 4.1 and Figure 4.2 and act as graphical devices for assessing normality. In conclusion it can be said that, due to skewness, all the variables used in the study are not normally distributed. However, it was assumed that the Learnership Performance variable was normally distributed, as Tabachnick and Fidell (1996) state that most inferential statistics are robust to violations of the assumption of normality.

Table 4.1: Analysis of Descriptives of all Variables

	Descriptive Statistics								
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	332	17.75	53.08	30.5683	6.97203	.589	.134	-.202	.267
Gender	332	0	1	.28	.451	.967	.134	-1.071	.267
Educational level	328	1	3	2.40	.710	-.751	.135	-.690	.268
Learnership performance	332	63	97	81.92	7.335	-.246	.134	-.557	.267

Notes: $N = 328$

Table 4.2: Analysis of Sub-Group Descriptives of Age Variable

Age_years * Race Group			
Age_years			
Race Group	Mean	N	Std. Deviation
Black	29.42	55	6.13
Coloured	30.80	277	7.12
Total	30.57	332	6.97

Age_years * Language			
Age_years			
Language	Mean	N	Std. Deviation
Afrikaans	30.77	282	7.07
Xhosa	29.77	41	6.87
Sotho	31.33	1	.
Tsonga	28.21	6	1.43
Sepedi	25.21	2	5.24
Total	30.57	332	6.97

Age_years * Region			
Age_years			
Region	Mean	N	Std. Deviation
Eastern Cape	30.18	101	7.60
Western Cape	30.86	223	6.76
Mpumalanga	27.46	8	2.71
Total	30.57	332	6.97

Table 4.3: Analysis of Sub-Group Descriptives of Educational Level Variable

Educational Level * Race Group			
Educational Level			
Race Group	Mean	N	Std. Deviation
Black	2.37	54	.68
Coloured	2.41	274	.72
Total	2.40	328	.71

Educational Level * Language

Educational Level

Language	Mean	N	Std. Deviation
Afrikaans	2.41	279	.718
Xhosa	2.38	40	.705
Sotho	2.00	1	.
Tsonga	2.50	6	.548
Sepedi	2.00	2	.000
Total	2.40	328	.710

Educational Level * Region

Educational Level

Region	Mean	N	Std. Deviation
Eastern Cape	2.31	99	.737
Western Cape	2.44	221	.702
Mpumalanga	2.38	8	.518
Total	2.40	328	.710

4.2.2 Correlations

The correlation results (refer to Table 4.4 and Table 4.5) are presented on the basis of hypotheses generated for the study. Hypothesis 1 predicted that a statistically significant negative relationship exists between a learner's Age and his/her Learnership Performance. Correlation results did not support the hypothesis, as Pearson's $r = -.034$ and Spearman's correlation coefficients ($\rho = -.002$) were not statistically significant. Hypothesis 2 predicted that Learnership Performance will, on average, be significantly higher for males. Correlation results did not support the hypothesis, with the finding of a non-statistically significant Spearman's correlation coefficient ($\rho = .080$). Hypothesis 3 predicted that a statistically significant positive relationship exists between Learnership Performance and Educational Level. The research results supported hypothesis 3 with statistically significant ($p < .01$) Pearson's $r = .342$ and Spearman's correlation coefficients ($\rho = .343$).

Table 4.4: Summary of correlation analysis (Pearson's r) on Gender, Age, Educational Level and Learnership Performance.

Variable		M	SD	1.	2.	3.	4.
1. Gender	Pearson Correlation	.28	.451	1	-.110*	.071	.083
	<u>Sig. (1-tailed)</u>				.023	.100	.065
2. Age	Pearson Correlation	30.57	6.97	-.110*	1	-.271**	-.034
	<u>Sig. (1-tailed)</u>			.023		.000	.268
3. Educational level	Pearson Correlation	2.40	.71	.071	-.271**	1	.342**
	<u>Sig. (1-tailed)</u>			.100	.000		.000
4. Learnership performance	Pearson Correlation	81.92	7.34	.083	-.034	.342**	1
	<u>Sig. (1-tailed)</u>			.065	.268	.000	

Note: $N = 328$ *. Correlation is significant at the 0.05 level (1-tailed). **. Correlation is significant at the 0.01 level (1-tailed).

Table 4.5: Summary of correlation analysis (Spearman's rho) on Gender, Age, Educational Level and Learnership Performance.

Variable		M	SD	1.	2.	3.	4.
1. Gender	Correlation Coefficient	.28	.451	1	-.120*	.067	.080
	<u>Sig. (1-tailed)</u>			.	.015	.114	.073
2. Age	Correlation Coefficient	30.57	6.97	-.120*	1	-.221**	-.002
	<u>Sig. (1-tailed)</u>			.015	.	.000	.488
3. Educational level	Correlation Coefficient	2.40	.71	.067	-.221**	1	.343**
	<u>Sig. (1-tailed)</u>			.114	.000	.	.000
4. Learnership performance	Correlation Coefficient	81.92	7.34	.080	-.002	.343**	1
	<u>Sig. (1-tailed)</u>			.073	.488	.000	.

Note: $N = 328$ *. Correlation is significant at the 0.05 level (1-tailed). **. Correlation is significant at the 0.01 level (1-tailed).

4.2.3 Regression

Multiple regression was used to calculate the contributions of Age, Gender and Educational Level to the prediction of Learnership Performance (results are shown in Table 4.6, Table 4.7 and Table 4.8). In addition, multiple regression was used to find the variable that is the strongest in predicting Learnership Performance. The results of the data analysis are presented below.

The results of the data analysis indicating the mean, standard deviation and correlation between the variables are shown in Table 4.6.

Table 4.6: Descriptive Statistics and Correlation between Variables

Variable		M	SD	1.	2.	3.	4.
1. Learnership performance	Pearson Correlation	82.01	7.30	1	-.039	.342**	.076
2. Age	Pearson Correlation	30.56	6.93	-.039	1	-.271**	-.110**
3. Educational level	Pearson Correlation	2.40	.710	.342**	-.271**	1	.071
4. Gender	Pearson Correlation	.29	.453	.076	-.110*	.071	1

Note: $N = 328$ *. Correlation is significant at the 0.05 level (1-tailed). **. Correlation is significant at the 0.01 level (1-tailed).

From these results, it is clear that the intercorrelation coefficients between the two variables, Age and Gender, and the criterion variable, Learnership Performance, were not significant (Age $r = -.039$; Gender $r = .076$). However, the intercorrelation coefficient between the variable Educational Level and the criterion variable was significant ($r = .342$; $p < .001$).

Table 4.7: Summary of Multiple Regression Analysis between the Predictor Variables (Gender, Educational level and Age) and the Outcome Variable (Learnership Performance).

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.351 ^a	.123	.115	6.871

a. Predictors: (Constant), Gender, Educational level, Age

b. Dependent Variable: Learnership performance

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2147.323	3	715.774	15.161	.000 ^a
	Residual	15296.200	324	47.210		
	Total	17443.523	327			

a. Predictors: (Constant), Gender, Educational level, Age

b. Dependent Variable: Learnership performance

Table 4.8: Relative Contribution of the Independent Variables to the Prediction of Learnership Performance

Model		Unstandardised Coefficients		Standardised Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	70.935	2.518		28.175	.000
	Age	.067	.057	.064	1.173	.242
	Educational level	3.650	.557	.355	6.556	.000
	Gender	.940	.845	.058	1.113	.267

Standard multiple regression analysis was performed between Learnership Performance as the dependent variable and Age, Gender, and Educational Level as independent variables. Table 4.7 and Table 4.8 display the unstandardised regression coefficients (B) and intercept, the standardised regression coefficients (β), the semipartial correlations R^2 , and adjusted R^2 .

R for regression was significantly different from zero, $F(3, 324) = 15.16, p < .001$. Only one of the independent variables, Educational Level, contributed significantly to prediction of Learnership Performance; the following standardised beta weights which represented the relative contribution of the independent variables to the prediction were observed:

- Age ($\beta = .064; t = 1.173$)
- Educational Level ($\beta = 0.355; t = 6.556; p < .001$)
- Gender ($\beta = .058; t = 1.113$)

The three independent variables in combination accounted for 11.5% of the total variance in Learnership Performance. Table 4.7 also indicates that the Analysis of Variance of the multiple regression data produced a significant F -ratio value at the 0.001 level ($F(3,324) = 15.161; p < .001$). In summary, Educational Level appeared to be the only variable that made a significant and unique contribution to Learnership Performance. For that reason, hypothesis 4 (a learner's Age explains unique variance in Learnership Performance when included in a regression model already containing measures of Gender and Educational Level) and hypothesis 5 (a learner's Gender explains unique variance in Learnership Performance when included in a regression model already containing measures of Age and Educational Level) are rejected. In

contrast, hypothesis 6 (a learner's Educational Level explains unique variance in Learnership Performance when included in a regression model already containing measures of Age and Gender) was supported.

4.2.4 Analysis of Covariance (ANCOVA)

Analysis of covariance (ANCOVA) is an extension of analysis of variance in which main effects and interactions of independent variables are assessed after the dependent variable scores are adjusted for differences associated with one or more covariates (Tabachnick & Fidell, 1996). If the covariates are measured, it is possible to control for the influence they have on the dependent variable by including them in the regression model (Field, 2005). One of ANCOVA's main purposes is to increase the sensitivity of the test of main effects and interactions by reducing the error term; the error term is adjusted for the relationship between the dependent variable and the covariates (Tabachnick & Fidell, 1996). In terms of the ANCOVA results, Table 4.9 shows the results of Levene's test when Age is included in the model as a covariate. Levene's test is not significant, indicating that the group variances are equal (hence the assumption of homogeneity of variance has not been violated).

Table 4.9: Levene's Test of Equality of Error Variances

Levene's Test of Equality of Error Variances^a			
Dependent Variable: Learnership performance			
F	df1	df2	Sig.
.577	5	322	.718

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Age + Educational level + Gender + Educational level * Gender

Table 4.10: Summary of Tests of Between-Subjects Effects

Tests of Between-Subjects Effects								
Dependent Variable: Learnership performance								
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	2770.479 ^a	6	461.746	10.102	.000	.159	60.609	1.000
Intercept	83914.707	1	83914.707	1835.790	.000	.851	1835.790	1.000
Age	65.651	1	65.651	1.436	.232	.004	1.436	.223
Education Level	1693.038	2	846.519	18.519	.000	.103	37.038	1.000
Gender	279.118	1	279.118	6.106	.014	.019	6.106	.693
Educational level * Gender	362.699	2	181.349	3.967	.020	.024	7.935	.709
Error	14673.044	321	45.710					
Total	2223683.866	328						
Corrected Total	17443.523	327						

a. R Squared = .159 (Adjusted R Squared = .143)

b. Computed using alpha = .05

Table 4.10 shows the ANCOVA Table testing group differences in Learnership performance, whilst controlling for Age as a covariate. There was a significant main effect of Educational Level and Gender on Learnership Performance after controlling for the effect of learner's Age, for Educational Level $F(2, 321) = 18.519, p < .001$ and Gender $F(1, 321) = 6.106, p < .05$. Furthermore, the interaction between Educational Level and Gender was statistically significant, since the interaction term explained unique variance in the Learnership Performance not accounted for by the other main effects, $F(2, 321) = 3.967, p < .05$. The covariate, Age, was not significantly related to Learnership Performance, $F(1, 321) = 1.436, p > .05$. It must, however, be pointed out that since this covariate by dependent variable interaction is significant, the assumption of homogeneity of regression slopes is not tenable. Although this finding is not surprising given the pattern of relationships, we urge caution when interpreting the results of the main analyses. Table 4.11 and Table 4.12 give the adjusted values of the group means and show that levels of Learnership Performance were higher for more educated learners, as well as for male learners, when controlling for Age differences.

Table 4.11: Parameter Estimates for Educational Level Variable

Estimates				
Dependent Variable: Learnership performance				
Educational level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Grade 7-9	80.509 ^a	1.282	77.986	83.031
Grade 10-11	79.319 ^a	.715	77.911	80.726
Grade 12	84.698 ^a	.562	83.593	85.803

a. Covariates appearing in the model are evaluated at the following values: Age = 30.5584.

Table 4.12: Parameter Estimates for Gender Variable

Estimates				
Dependent Variable: Learnership performance				
Gender	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Female	80.217 ^a	.515	79.205	81.230
Male	82.799 ^a	.907	81.015	84.584

a. Covariates appearing in the model are evaluated at the following values: Age = 30.5584.

In Table 4.13 and Table 4.14, planned contrasts reveal that having high levels of education ($p = .01$) and being male ($p < .05$) significantly increased Learnership Performance compared to having low levels of education and being female.

Table 4.13: Pairwise Comparisons for Educational Level Variable

Pairwise Comparisons						
Dependent Variable: Learnership performance						
(I) Educational level	(J) Educational level	Mean Difference (I-J)	Std. Error	Sig. ^a	95% Confidence Interval for Difference ^a	
					Lower Bound	Upper Bound
Grade 7-9	Grade 10-11	1.190	1.467	.803	-2.330	4.710
	Grade 12	-4.189*	1.413	.010	-7.581	-.798
Grade 10-11	Grade 7-9	-1.190	1.467	.803	-4.710	2.330
	Grade 12	-5.379*	.911	.000	-7.565	-3.193
Grade 12	Grade 7-9	4.189*	1.413	.010	.798	7.581
	Grade 10-11	5.379*	.911	.000	3.193	7.565

Based on estimated marginal means

a. Adjustment for multiple comparisons: Sidak.

*. The mean difference is significant at the .05 level.

Table 4.14: Pairwise Comparisons for Educational Level Variable

Pairwise Comparisons						
Dependent Variable: Learnership performance						
(I) Gender	(J) Gender	Mean Difference			95% Confidence Interval for Difference ^a	
		(I-J)	Std. Error	Sig. ^a	Lower Bound	Upper Bound
Female	Male	-2.582*	1.045	.014	-4.638	-.526
Male	Female	2.582*	1.045	.014	.526	4.638

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Sidak.

In Figure 4.3, the profile plots are provided for the group comparisons of Learnership Performance, when controlling for Age as a covariate. It is clear from inspecting this Figure that Gender differences in learners' performance exist mainly at lower levels of Educational Level, when controlling for Age differences. At higher levels of education, these Gender differences seem to disappear.

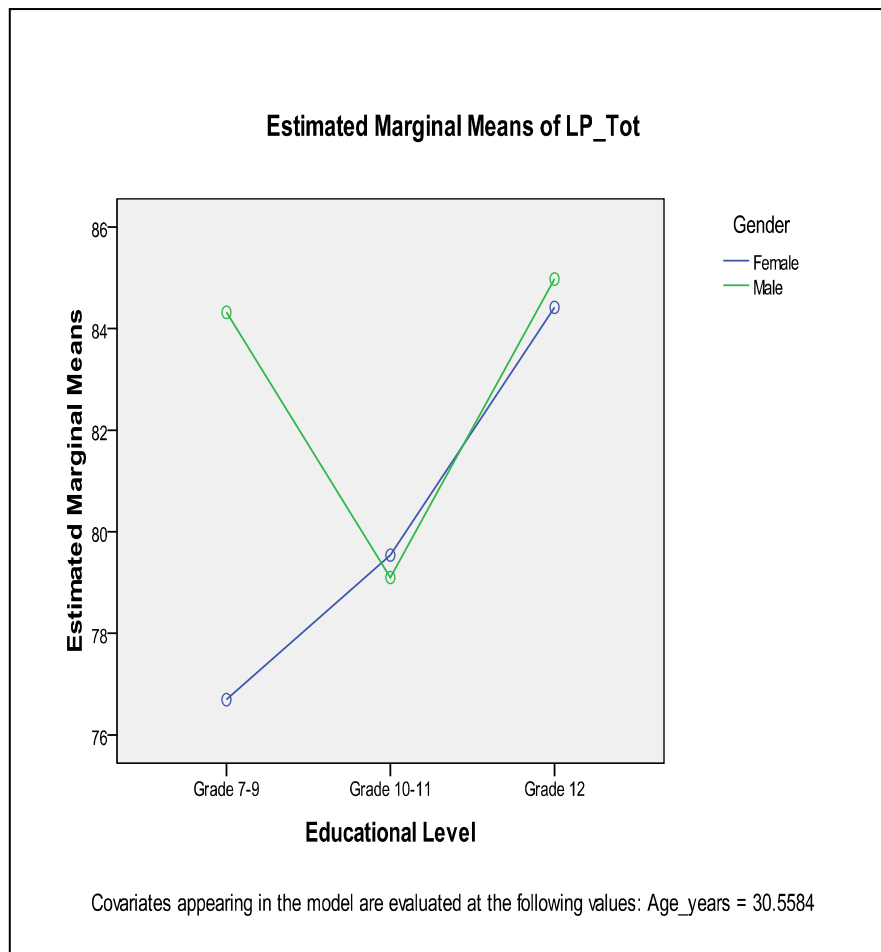


Figure 4.3: Profile plots for group comparisons of Learnership Performance when controlling for Age as covariate

In summary, the findings of the quantitative component show that the demographic characteristics Age and Gender are not statistically significantly related to Learnership Performance. However, Educational Level appeared to have a statistically significant relationship with Learnership Performance. In addition, in terms of the relative importance of each variable (i.e., Age, Gender and Educational Level) when included in a joint regression model, results indicated that Educational Level is the only variable that made a significant and unique contribution to Learnership Performance. The operational framework to illustrate the above relationships is presented in Figure 4.4.

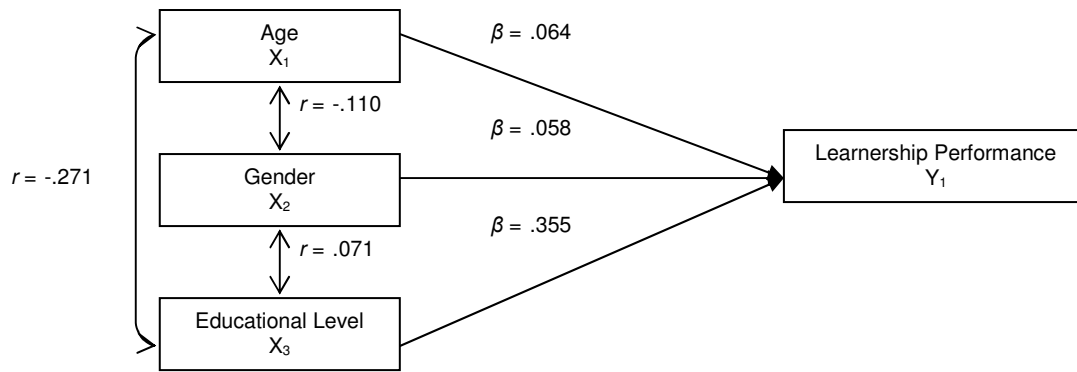


Figure 4.4: Operational framework to illustrate observed relationships between demographic characteristics (i.e., Age, Gender and Educational Level) and Learnership Performance

4.2.5 Statistical power

It is critically important to assess the adequacy of statistical power available in one's set of significance tests. The importance of testing statistical power derives from the fact that most empirical research in the social and behavioural sciences proceeds by formulating and testing null hypotheses, which the researcher hopes to reject as a means of establishing facts about a certain phenomenon (Cohen, 1992). The consequence is that, if significance tests lack sufficient statistical power, it implies that these tests cannot reliably discriminate between H_0 and the alternative hypothesis H_a (Faul, Erdfelder, Lang & Buchner, 2007).

The guidelines proposed by Tabachnick and Fidell (1996) recommend that a sample size of $N \geq 50 + 8m$ is required for testing multiple correlation coefficients and for testing individual predictors, $N \geq 104 + m$ is required, where m is the number of independent variables. In the present sample, there were three predictors, therefore adequate sample size of $N = 74$ in the case of the first equation and $N = 107$ in the case of the second equation was estimated when planning the required sample size. Against these criteria, the obtained sample size in this study ($N = 340$) was deemed sufficient for adequate statistical power for the main regression analyses that were used to test the hypotheses.

The exact achieved power estimates were also calculated *post hoc*. Calculation of statistical power is dependent on the particular statistical analysis techniques being used. In order to determine the statistical power of the analyses used in the present

study, G*Power 3.1 (Faul et al., 2007), which is a power analysis program, was used. The results of the power analysis¹ indicated highly satisfactory statistical power ($> .80$) for all analyses, e.g., for multiple regression analysis² ($1 - \beta = .99$) and the ANCOVA ($1 - \beta = 1.00$)³. For more information on power calculations, the input and output parameters are consequently displayed (see Figures 4.5 and 4.6).

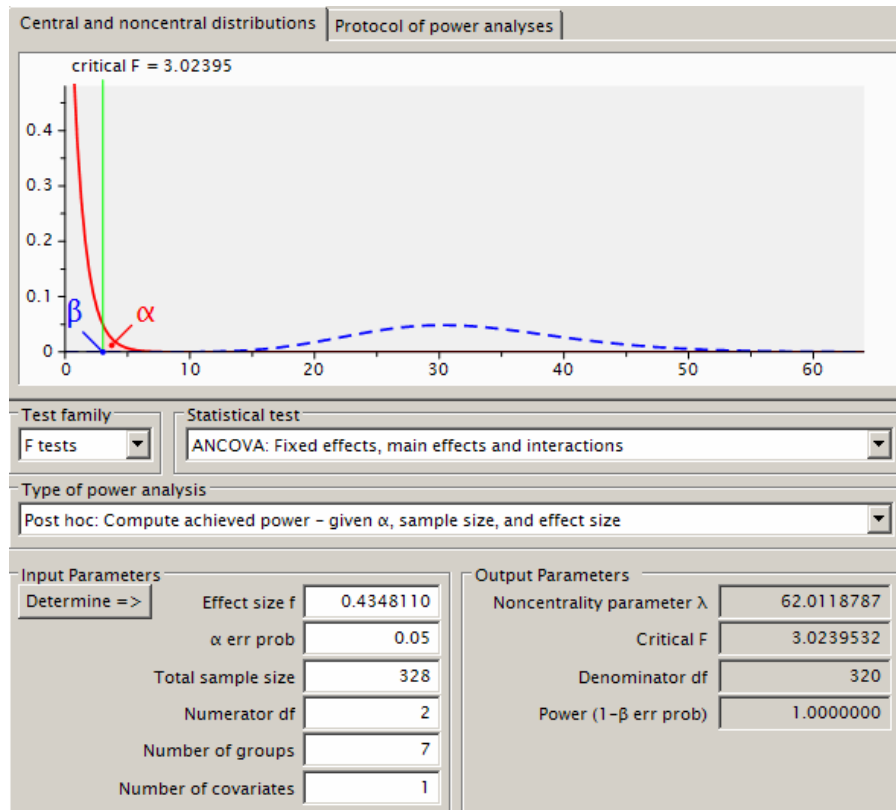


Figure 4.5: Power Analysis Input and Output Parameters for Regression Analysis

¹ . $N = 328$, $\alpha = 0.05$ for all analyses.

² F-test – Linear Multiple Regression: Fixed model, R^2 deviation from zero, Post hoc: compute achieved power

³ F-test – ANCOVA: Fixed effects, main effects and interactions, Post hoc: compute achieved power

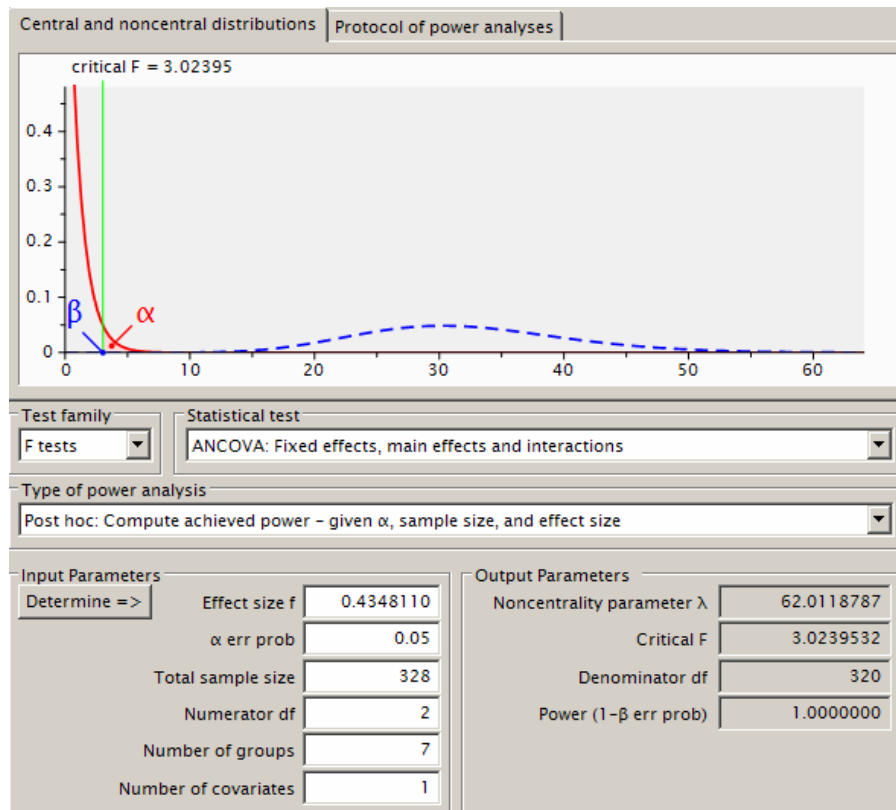


Figure 4.6: Power Analysis Input and Output Parameters for ANCOVA Analysis

4.3 Qualitative Results

4.3.1 Introduction

The following section will be devoted to reporting results obtained in the qualitative component of the study, i.e., through the basic individual interview process. The purpose of the basic individual interviews was to confirm, and provide further clarity on, the results of the quantitative component of the research study. Findings will be reported in the form of comments made by participants during the basic individual interviews.

Qualitative coding was used during the data analysis to organise the raw data into categories and to establish general themes in the data (Neuman, 1997). As discussed in chapter 3, information was captured during the basic individual interviews by writing down participants' comments in a template especially developed for the study (see appendix D). Examples of comments that were written down were, for instance: "My husband and child helped and supported me while I was studying", "A person is

never too old to learn”, “I was comfortable with the facilitator”, “The facilitator gave individual attention to each of us”, etc.

Once the interviews were concluded, all the information (or comments) obtained was analysed by utilising the three different phases of qualitative coding, i.e., open coding, axial coding, and selective coding. Open coding was performed first and mainly involved reading through all the information and locating common themes in the data. The creation of categories allowed for easier comparison to findings obtained in the quantitative component of the study. A category for ‘Age’ was for example created for comments like “A person is never too old to learn”, while comments such as “I was comfortable with the facilitator”, “The facilitator gave individual attention to each of us”, etc. pointed toward a theme related to ‘Facilitator Attributes’. Categories were created by thinking about the comments, by exchanging ideas with a colleague, and by referring to research literature on the subject(s). Initial codes were subsequently allocated to the different themes identified. The theme of ‘Age’, for example, were coded with a number one (1), the category of ‘Gender’ with a number two (2), the theme of ‘Facilitator Attributes’ with a number four (4) and so forth. The classification of themes helped us to start the second phase of coding, i.e., the axial coding, with an organised set of codes or concepts.

During the axial coding, we considered aspects such as possible causes of comments, interaction of themes, and concepts that can be clustered together. Discussions with a colleague and/or reference to research literature, for example, suggested that comments like, “My husband and child helped and supported me while I was studying”, “I am a single parent and found it difficult to study at home” could, for the purposes of this study, both be clustered together under a theme for ‘Gender’. Similarly, comments such as “I was comfortable with the facilitator”, “The facilitator did not give some people preferential treatment”, etc. appeared to be caused by qualities of the facilitator and hence it was categorised under the theme of ‘Facilitator Attributes’.

After conclusion of the axial coding phase, a final coding phase, called selective coding, was conducted. During this phase, the main themes already identified e.g., Age, Gender, Facilitator Attributes, etc. guided the researcher’s search for issues such as comparisons, contrasts, etc. between data. Comparisons made between

comments such as “My colleagues supported me during the learnership and were willing to stand in for me at work when required”, “It was easy to learn on the learnership, because it focused on things that we encounter in the workplace on a daily basis”, etc. for example, led to inclusion into the same, but broader category, such as ‘Organisation Support’.

Results will be presented firstly by relating it to the three demographical variables that were used in the quantitative section of the study and secondly, by reporting additional themes that may influence learners’ learnership performance.

4.3.2 Demographic characteristics

Analysis of information obtained from the interviews supported the hypotheses that individuals’ demographic characteristics may affect their learnership performance. Demographic characteristics in this study refer to participants’ age, gender, and educational level. General comments that can be related to these demographic characteristics as themes are depicted in Table 4.15. The comments included in Table 4.15 are those comments that the researcher was of the opinion represented, or described, the identified themes most accurately.

4.3.2.1 Age

In terms of examining the qualitative information regarding the association between age and learnership performance, results appear to show that a relationship exists between age and learnership performance. However, the results do not show whether the relationship is a positive or negative one. A possible negative relationship between age and learnership performance can be identified from comments obtained from some of the older participants, who felt that they could have benefited more from the learnership if they were still younger. Conversely, some participants suggested that it does not matter at what age you participate in the learnership and that a person is never too old to learn. The latter leans more towards a probable positive relationship between age and learnership performance, with older people illustrating higher training motivation than younger people. It can therefore be concluded that although the qualitative information on the relationship between age and learnership performance could not clearly define the detail of the relationship, it does seem to suggest that a relationship exist between age and learnership performance.

4.3.2.2 Gender

With regards to analysing the qualitative results concerning a potential relationship between gender and learnership performance, it was generally observed that a participant's family appeared to play a substantial role in their learnership performance. Several people, for example, stated that they had difficulty in managing their house chores (i.e., looking after family) and studying at the same time. Seeing that family roles in South Africa mostly establish that females are responsible for the house chores (Mandela, 1993), it can be concluded that the majority of people who find it difficult to manage their house chores and studies at the same time will be females and hence, females' learnership performance can be expected to be lower. A contrary observation in the qualitative results involved a number of participants commending their families for the support they provided during participation in the learnership. The exact nature of the support was not clearly specified but appeared to involve emotional support and/or the physical assistance with house chores. Although the idea of family support can be applied to both genders and their learnership performance, the conclusion can be drawn that the differences between learnership performance of males and females, caused by family roles, can be lessened by means of good family support and support structures.

4.3.2.3 Educational level

In the case of a possible relationship between educational level and learnership performance, the qualitative results appear to point towards a general view that educational level may have a positive relationship with learnership performance. Participants, for example, believed that their previous education and experience of learning assisted them to perform better on the learnership. The main implication of this finding is the suggestion that people with a higher educational level are likely to achieve higher learnership performance.

Table 4.15: Summary of Basic Individual Interview Results for Demographic Characteristics (i.e., Age, Gender, and Educational Level)

Category	Derived Themes
Age	<p>“If I had the learnership earlier in my life, it would have meant more to me.”</p> <p>“A person is never too old to learn.”</p>
Gender	<p>“My husband and child helped and supported me while I was studying.”</p> <p>“My wife helped me with my homework.”</p> <p>“My family showed interest in me and my studies.”</p> <p>“My sisters have good Educational levels and good jobs. Now that I have completed the learnership, I do not feel left out anymore.”</p> <p>“I am a single parent and found it difficult to study at home”.</p> <p>“If you have a wife and children, like I do, it is difficult to study at home.”</p> <p>“House chores and family responsibilities come before school and study work.”</p> <p>“I got pregnant while I was still young and had to leave school. I am thankful for this opportunity to learn.”</p>
Educational Level	<p>“School and previous training courses helped me to understand the learnership work that we did.”</p> <p>“The education and experience that I obtained at school helped me to perform better on the learnership.”</p> <p>“Now that I have completed the learnership, I would like to go on more training courses.”</p> <p>“As I learned new things on the learnership, I wanted to learn more. It went well when I got into learning, etc.”</p> <p>“The more I learn, the more I want to learn.”</p>

4.3.3 Additional Themes or Factors

In addition to findings related to demographic characteristics, the qualitative information also highlighted the following themes or factors that may influence learners’ learnership performance:

1. Facilitator and Group attributes
2. Organisation Support
3. Career Planning

These themes have been included in the study because it is believed that it may be related, or act as underlying causes, to some of the observed relationships between demographic characteristics and learnership performance described earlier. Investigation of these factors may therefore assist in improving the comprehension of the relationship between demographic characteristics and learnership performance.

4.3.3.1 Facilitator and Group Attributes

Analysis of information obtained from the interviews (see Table 4.16) supported the view that attributes of the facilitator and/or learning groups may affect individuals' learnership performance. Existing training literature, for example, propose that facilitator competencies like listening actively, counselling students, building relationships with students and attending to individual differences of trainees are important to ensure effective training (Gauld & Miller, 2004). Research literature also states that different groups of employees have different chances for learning (Kyndt, Dochy & Nijs, 2009) and that workmates are central to learning (Coetzer, 2007). The relevance of these issues was evident in the participants' feedback like "we had a good relationship with the facilitator...", "I was comfortable with the facilitator", "we were a bit shy..." etc. In terms of the relationship with individuals' demographic characteristics, it is suggested that older individuals and/or individuals with higher educational levels may have more experience about facilitators and facilitator attributes. They are therefore able to appreciate highly skilled facilitators, identify with them, and produce higher learnership performance. In contrast, younger individuals and/or individuals with less educational levels may have had less exposure to facilitators and may feel intimidated by them. For this reason, facilitators may need to spend more time in building relationships with, and obtaining the trust of, younger and/or less educated people. It can therefore be argued that younger and/or less educated people will need more attention and support from facilitators to obtain high learnership performance than what their older and more educated counterparts do.

Table 4.16: Summary of Basic Individual Interview Results for additional factors that may influence Learnership Performance: Facilitator and Group attributes

Category	Derived Themes
Facilitator and Group Attributes	<p>“We had a good relationship with the facilitator; he was willing to listen to us and answer questions that we had.”</p> <p>“I was comfortable with the facilitator.”</p> <p>“The facilitator helped me to relax and feel at ease during classes; I had the confidence to ask questions.”</p> <p>“The facilitator did not give some people preferential treatment.”</p> <p>“The facilitator gave individual attention to each of us.”</p> <p>“We were a nice group of class mates. We solved problems together and looked forward to seeing each other in the next class.”</p> <p>“We were a bit shy; we should have talked more.”</p> <p>“The classes were to long.”</p> <p>“The learnership course was too long.”</p>

4.3.3.2 Organisation Support

Comments made during the basic individual interviews (see Table 4.17) supported the understanding that organisation support may affect individuals’ learnership performance. Earlier research like Chiaburu and Tekleab (2005), for example, found that a direct relationship exists between training motivation and an organisation culture of continuous-learning ($r = 0.34$) and supervisor support ($r = 0.31$) respectively. These findings are congruent with that of Tannenbaum and Yukl (1992) who suggested that a lack of support from managers and peers may act as a barrier to transfer of learning.

In more practical terms, Belling, Jame and Ladkin (2004) and Newstrom (1986) suggested that organisation support during training is important to ensure that the day-to-day pressures of work do not become obstacles to transfer of learning. These aspects were identified during the individual interviews, with participants’ statements like “my peers encouraged me to go on the learnership”, “my colleagues supported me during the learnership and were willing to stand in for me at work when required”,

“it is difficult to give attention to work and study”, etc. Other dimensions under the organisation support theme include that a lack of reinforcement back on the job may act as a barrier to learning (Newstrom, 1986). Holton, Bates, Seyler and Carvalho (1997), for example, suggested that training outcomes will be higher if employees get the opportunity to use and apply what they have learned. Qualitative findings like “we can implement what we have learned”, “we were more confident as we now knew what the right method was to do things”, etc. supported this research literature.

With regards to the organisation support theme’s role in the relationship between individual demographic characteristics and their learnership performance, it can be proposed that older people are more likely to have build up a long-term work relationship with their employer and hence, may attach greater value on the support that they receive from their employer. On the other hand, research literature like Urwin (2006) and Newton (2006) clearly shows that younger people receive more support from their employer when it comes to training activities. Similarly, males are seen to receive more organisation support during training exercises than what females do (Renaud et al., 2006). In terms of the educational level, it is suggested that people with higher educational levels will need less organisation support during training activities, as they are more familiar with learning and hence, can learn and prepare more independently than poorly educated people. In conclusion, it is believed that organisation support does play a role in the relationship between individuals’ demographic characteristics and their learnership performance. Research literature indicates that younger people and males are more likely to receive a higher amount of organisation support during training programmes. These practices may however create a paradox, as older employees, females and people with less educational levels might actually have a greater need for good organisation support.

Table 4.17: Summary of Basic Individual Interview Results for additional factors that may influence Learnership performance: Organisation Support

Category	Derived Themes
Organisation Support	<p>“It is good that our employer gave us the opportunity to participate in a learnership.”</p> <p>“Our manager gave us time to prepare for class.”</p> <p>“I did not mind going on the learnership, as we did not lose out on our wages – our wages were paid during days that we were on the learnership.”</p> <p>“My colleagues supported me during the learnership and were willing to stand in for me at work when required.”</p> <p>“My peers encouraged me to go on the learnership.”</p> <p>“It is difficult to have classes in the afternoon; we are tired of the work in the morning.”</p> <p>“It is difficult to give attention to work and study – especially during the season-time or if you worked night shift and have to attend learnership class the following day.”</p> <p>“It is difficult for senior people, with a lot of responsibilities, to concentrate during classes – you’re head is at your job that needs to be done.”</p> <p>“It was easy to learn on the learnership, because it focused on things that we encounter in the workplace on a daily basis.”</p> <p>“We can implement what we have learned.”</p> <p>“We were more confident as we now knew what the right method was to do things.”</p> <p>“The learnership helped me to understand my role and responsibilities at work better.”</p> <p>“It is frustrating when low educated people do not understand if you want to implement something that you have learned in the learnership classes.”</p>

4.3.3.3 Career Planning

A last theme identified during the individual interviews involved the issue of ‘Career Planning’. More specifically, findings of the basic individual interviews (see Table 4.18) supported the idea that an individual’s career planning may affect his or her learnership performance. These conclusions were drawn from comments like “I enrolled for the learnership, because it will help me in the future”, etc. The conclusion that an individual’s career planning may affect his or her learnership performance is supported by research literature. Noe and Schmitt (1986), for example, found career planning and training motivation to be positively correlated.

In terms of career planning's role in the relationship between demographic characteristics and learnership performance, it is proposed that younger people, males and people with higher educational level spend more time on career planning and attach greater value to it. The proposition is made based on the rationale that younger people will be more concerned about their future and career than older people. Similarly, family roles dictate that males are the primary breadwinner in a household and as a result, it is thought that he will attach greater value to his career than what a woman might do. Lastly, people with higher educational levels will probably be more bold in terms of career expectations and might do more with regards to career planning than what a less educated person might do.

Table 4.18: Summary of Basic Individual Interview Results for additional factors that may influence Learnership Performance: Career Planning

Category	Derived Themes
Career Planning	<p>“I enrolled for the learnership, because it will help me in the future.”</p> <p>“Since I have completed the learnership, I have been moved to a more challenging position.”</p> <p>“Now that I have completed the learnership, there are more people that report to me.”</p>

In summary, the findings of the qualitative component appear to suggest that factors such as demographic characteristics (i.e., age, gender and educational level), facilitator and group attributes, organisation support and career planning may influence individuals' learnership performance.

In summary, the conceptual framework for these proposed relationship(s) is illustrated in the following diagram (Figure 4.7).

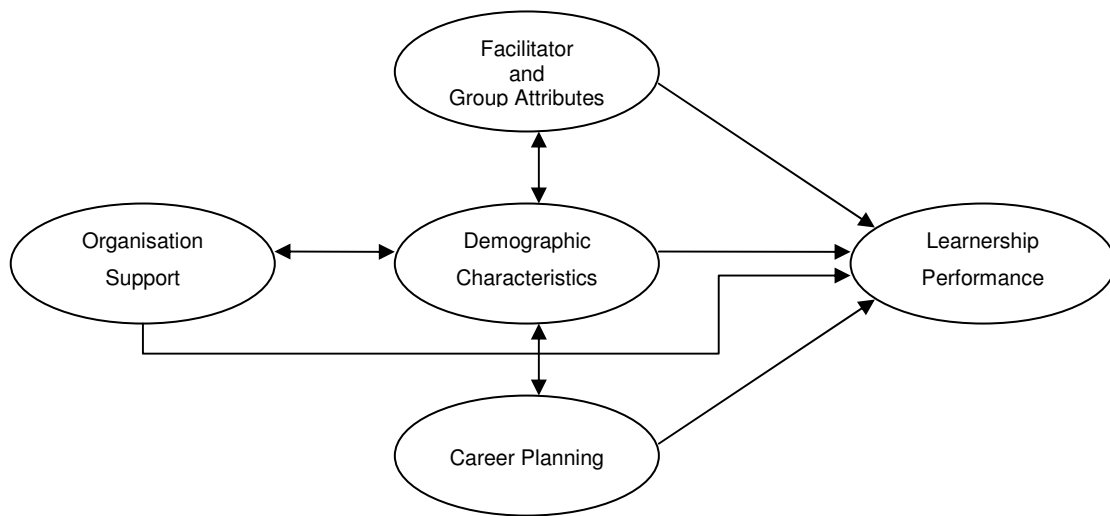


Figure 4.7: Conceptual framework to illustrate suggested relationships between Demographic characteristics, Facilitator and Group Attributes, Organisation Support, Career Planning and Learnership performance

4.4 Conclusion: Chapter 4

In terms of the quantitative research findings, the correlations revealed that the variables Age and Gender, respectively, were not correlated to Learnership Performance. On the other hand, hypothesis 3, which predicted that a statistically significant positive relationship exists between Learnership Performance and Educational Level, was supported with statistically significant ($p < .01$) Pearson's r ($r = .342$) and Spearman's correlation coefficients ($\rho = .343$) being observed.

The results from the regression analysis showed that the three independent variables (Age, Gender and Educational Level) in combination accounted for 11.5% of the total variance in Learnership Performance. However, Educational Level appeared to be the only variable that made a contribution to Learnership Performance ($\beta = 0.355$; $t = 6.556$; $p < .001$)

Lastly, conclusions that were drawn from the ANCOVA analysis include that there was a significant main effect of Educational Level and Gender on Learnership

Performance after controlling for the effect of learner's Age, for Educational Level and Gender. Learnership Performance was higher for more educated learners, as well as for male learners, when controlling for age differences. Planned contrasts reveal that having high ($p = .01$) levels of education and being male ($p < .05$) significantly increased Learnership Performance compared to having low levels of education and being female.

With reference to the qualitative research findings, results suggested that a relationship exist between age and learnership performance. However, the information could not specify whether the relationship between age and learnership performance was negative or positive. The qualitative results further propose that traditional family roles may lead to males obtaining higher learnership performance. Yet, the qualitative results do inform that the discrepancies between males' and females' learnership performance, caused by family roles, can be lessened by means of good family support and support structures. An additional qualitative finding involved the suggestion that people with a higher educational level will achieve higher learnership performance.

In addition to observing relationship between learnership performance and participants' biographical characteristics, the qualitative research results also enabled the researcher to develop a preliminary conceptual framework, which can be tested in further research into factors that influence learnership performance. Initial propositions that the conceptual framework put forward include that features such as facilitator and group attributes, organisation support and career planning may influence individuals' learnership performance.

In summary, most, but not all of the suggested hypotheses in this study were supported by the results of statistical and qualitative data analyses. Further discussion of the findings, as well as a synthesis between the quantitative and qualitative results, follows in the next chapter.

CHAPTER 5: DISCUSSION OF RESULTS

5.1 Introduction

As was emphasized in Chapter 1, learnerships fulfil a critical role as vehicles of human resource development in the South African labour market (Strong, 2000). Because of the importance of learnerships to the financial success of the national economy, individual industries and organisations that utilise learnerships, it is essential that a common understanding of the factors that contribute to learnership success in general, but also, *performance* of learners on these structured programmes in particular, be developed. Research that illuminates the antecedents of success in formal learnership programmes, such as the one studied in the present research, could serve the purpose of not only enhancing learnership success by better training design, training delivery and support mechanisms, but also start to address demographic inequalities that are pervasive in South African society.

The present research built upon a substantial body of knowledge (highlighted in the literature review, see chapter 2) which shows that biographical characteristics can be important determinants of success of learners undergoing training and development opportunities. In the South African socio-economic context, a relationship between biographical characteristics and performance in training could point to the possibility that disparities exist in equal opportunity to perform on these developmental interventions. Understanding whether such patterns of performance can be distinguished on the basis of demographic characteristics could allow practitioners to explore and address the causal mechanisms that lead to disparities in learnership performance, to remove barriers that restrict performance, and to encourage supportive mechanisms that enhance learnership performance.

This study aimed to address the above-mentioned need by firstly investigating the relationship between individuals' demographic characteristics within a sample of learners enrolled in a structured learnership programme, using firstly a quantitative approach to gauge the magnitude of such postulated effects, and secondly, by interpreting and further examining the quantitative findings by means of a qualitative approach that utilised semi-structured interviews. The latter exploration led to the

identification of possible causal mechanisms that help to explain the quantitative results, i.e., they showed possible reasons why certain demographic characteristics are associated with the criterion variable. In addition, the qualitative data (i.e., structured interviews) indicated related peripheral factors that may influence individuals' learnership performance. In conclusion, these qualitative results were interpreted and integrated into a suggested conceptual framework of supportive and restrictive factors that affect learnership performance in the particular industry that was studied.

This final chapter discusses general conclusions that can be drawn from the research findings that were derived from both the quantitative and qualitative data. It also points out certain limitations of the study, which should be kept in mind when interpreting the results. Finally, recommendations for future research are provided in the last section of the present chapter.

5.2 General conclusions

5.2.1 Quantitative results

The quantitative research approach was used to test three hypotheses about the relationship between the predictor variables (i.e., age, gender, and educational level) and the dependent variable (learnership performance). In addition, three further hypotheses were developed and tested, which examined the proportion of unique variance in the criterion each predictor variable would explain when included in a combined regression model. As discussed in chapter 4, the findings showed that some of the hypotheses were supported by results obtained from the correlation and regression analyses, but others did not receive support. These results are discussed next. The findings are also discussed within the context of prior research evidence and, given the results obtained, conclusions are made with respect to the relationship between the predictor variables and the criterion. For the sake of clarity, the discussion is conducted according to the hypothesised relationships, which is followed by a synthesis of the quantitative results.

5.2.1.1 Age

Based on the literature study, a statistically significant negative relationship was expected between age and learnership performance since prior research showed that training performance tends to decline with age. Correlation results, however, did not

produce statistically significant findings. The results are in contrast with research literature that suggest that older employees learn slowly (Charness et al., 2001), are less motivated to participate in training programmes (Newton, 2006) and, according to more recent research evidence, offer a lower return on investment (Ng & Feldman, 2008).

The reasons for the lack of a relationship between age and learnership performance is not clear, however, we can only offer speculation in this regard. Firstly, statistical artefacts such as restriction of range in the scores of measures may have artificially deflated the magnitude of observed correlations (Cohen et al., 2003). This plausible rival hypothesis was tested by scrutinising the descriptive statistics for age ($M = 30.57$, $SD = 6.97$) and learnership performance ($M = 81.92$, $SD = 7.34$). It appears that these descriptive statistics were within acceptable ranges, leading to the rejection of the notion that a lack of variability in the scores may have deflated the observed correlation.

A more likely reason for the finding that age and learnership performance did not correlate in the present study may be related to the fact that older employees did not have the opportunity to partake in education and training activities when they were younger and hence, are now motivated to use the opportunity and to make a success of their studies. In support of this plausible rival hypothesis, this notion was suggested by a small number of participants that took part in the qualitative semi-structured interviews.

Another possible explanation may involve the possible role of acquisition of prior work experience. The curricula used in the present learnership programme focused on the actual job or trade that the individuals perform on a daily basis, in other words, the criterion variable operational measure approached the form and nature of a *high fidelity* work sample. As older people have worked longer, they have obtained more experience on the job and that may have assisted them to grasp the learnership training material better and, thereby, obtain higher learnership performance scores because of the confounding influence of prior work experience.

A more distal explanation was suggested by the qualitative data, which pointed to the possibility that younger learners in the sample did not generally exploit the

opportunity to partake in training programmes as much as older people did. In comparison to those enjoyed by earlier generations, training and development opportunities for previously disadvantaged people are now plentiful in the South African labour market and, hence, it could create a situation that young people take these opportunities for granted. If this were true, an implication of this finding would be that opportunities for learnerships should not be withheld from older learners because of their age. In the present study, older learners did not perform poorer than younger learners and therefore showed similar levels of mastery of the material.

On the other hand, since it is clear from prior research that younger learners tend to partake more (Newton, 2006) in training programmes and tend to outperform (Charness et al., 2001) older learners, it may be beneficial to explore the need to reinforce the importance of training in younger employees in an attempt to motivate them to participate and perform better in these learnership training programmes.

5.2.1.2 Gender

In terms of the predictor variable gender, it was anticipated that learnership performance would, on average, be significantly higher for males. The research results, however, did not support this hypothesis. In other words, gender groups did not differ significantly in their learnership performance. These conclusions are in contrast with research literature that suggests that female learners normally do not have the same opportunity to develop equitable levels of learning performance. Female learners tend to receive less training opportunities than males (Renaud et al., 2006) and their participation in educational activities are often limited by socio-cultural constrictions (Annan-Yao, 2004) and sex role perceptions (Mandela, 1993). It could be argued that these conditions have been particularly prevalent in pre-democratic (i.e., prior to 1994) South African society.

The result of this specific analysis may also be linked to the fact that the research sample was disproportionately female biased and hence, the correlation results may have been affected in a negative way due to the unequal split in terms of the categorical variable of gender (Field, 2005). The implications of this finding involve that males and females, due the apparent similarity in their levels of learnership performance, do not seem to require unique supportive interventions before or during the implementation of learnership programmes.

5.2.1.3 Educational level

Based on the research literature as foundation, a statistically significant positive relationship between learnership performance and educational level was predicted. Research results that showed statistically significant correlations between learners' levels of education and their learnership performance supported this hypothesis. These findings concur with prior research that showed that learners with higher educational levels receive more training opportunities (Renaud et al., 2006), have higher training motivation (Wagner & Flannery, 2004) and experience fewer social obstacles to educational participation (Devanney, 2009). Educational levels also tend to covary with general cognitive ability, which tends to be one of the best ($\rho = .56$) predictors of training performance (Schmidt & Hunter, 1998).

The implications of these findings entail that less educated people in learnership settings represent the vulnerable portion of the training audience and, therefore, should receive more educational and motivational support to partake in, and perform well on, learnership programmes. In addition, more should be done to explore, address and eradicate the social obstacles to educational participation that people with lower educational levels still face. This issue is elaborated upon in the qualitative research results that are presented later.

5.2.1.4 Regression results

In addition to the correlation analysis, multiple regression analysis was used to test the hypotheses that the predictors age, gender and educational level each explained unique variance in learnership performance when collectively incorporated into a regression model. This analysis was conducted because of the possibility that the predictors share variance due to collinearity and, hence, may not equally predict learnership performance when used jointly in a regression model (Cohen et al., 2003).

The results of the regression analysis were in line with the correlation analysis results, which showed that only educational level explained unique variance in the criterion and, by implication, also had the greatest weight in the predictive model. When combined into a regression model, the three independent variables (Age, Gender and Educational Level) accounted for 11.5% of the total variance in Learnership

Performance. However, as mentioned earlier, the contributions of age and gender in this model was not significant.

The implications of the results of the regression analysis is that learnership performance can be reliably predicted from biographical variables related to educational level and, hence, represent important characteristics from which expected learnership performance can be estimated. Using this regression model, it is possible to estimate future learners' vulnerability to poor performance on learnership programmes. This type of information could be used to classify learners into special supportive treatment cohorts that receive closer performance monitoring and are targeted with additional supportive interventions. In this sense, a pre-emptive approach could be followed using the regression model developed in the present research, which could lead to lower training failure rates and concomitant cost savings. A suggestion for future practice and research that intends to determine the predictors of training performance follows from the present results: learners' biographical characteristics, especially educational level, could probably considerably enhance the prediction of learnership performance in particular, and probably, training performance in general. One exception for this recommendation would, however, be the case where training samples are heterogeneous in terms of educational levels, which implies that this variable may not be predictive due to restriction of range (Cohen et al., 2003) in the predictor scores. However, due to the overall lack of good congruence between the present results and those reported in literature, it appears that biographical factors tend to be situationally specific predictors of training performance. From the set of predictor measures, only educational level seems to be a generalisable predictor of training performance and should therefore form the backbone of biographical predictor models.

5.2.2 Qualitative results

In terms of the qualitative research component, basic individual interviews were utilised to seek confirmation for, and provide further clarity on, the results of the quantitative component of the research study. The nature of the qualitative results was discussed in chapter 4. In the following section of the thesis, the main conclusions that were drawn from the analysis of the interview data is presented by following the same structure used in reporting the quantitative results, i.e., firstly the demographic

characteristics, followed by the related supportive and restrictive factors affecting learnership performance. Lastly, the congruence of these results with the quantitative findings is discussed.

5.2.2.1 Demographic characteristics

When comparing the quantitative and qualitative results pertaining to the relationship between demographic characteristics and learnership performance, information obtained during the basic individual interview process did not agree strongly with the quantitative results, as interpreted by the researcher.

Generally speaking, the respondents were interpreted to express the view that a relationship existed between individuals' demographic characteristics and their learnership performance. However, the interviewees frequently refrained from clarifying the directionality of these relationships. In a few cases, respondents did make the direction of these relationships relatively clear, but the group of interviewees was ambivalent about their views. This ambivalence was the strongest when the age-learning performance relationship was discussed. For example, a negative relationship between learners' age and learnership performance was identified from comments obtained from certain of the older participants, who felt that they could have benefited more from the learnership if they had been younger. Conversely, a positive relationship between age and learnership performance was identified with some participants suggesting that the age of enrolment in the learnership was irrelevant and that a person was never too old to learn.

Despite the lack of agreement about the influence of age on learnership performance, there was greater consensus with regards to gender-related learnership performance. A general trend was observed in that female learners were viewed as experiencing greater challenges in coping with their familial responsibilities at home while engaged in the learnership opportunity, e.g., when studying at home. This finding concurs with prior research evidence speaking to this issue and which were highlighted earlier in the literature survey.

In the case of the relationship between learners' educational levels and learnership performance, the qualitative results appear to concur with the quantitative results. Interviewees generally expressed the view that education had a positive relationship

with learnership performance, similar to the strong statistical relationship between these variables in the present sample, highlighted earlier.

A number of inferences can be drawn from the interview data that relate to the way in which demographic factors affect learnership performance. It seems plausible that age affects learnership performance by means of some third variable. The interview data clearly suggest that age, for instance, affected participants' general motivation to engage in the learning opportunity. As a result, it is suggested that the training motivation of both older and younger learners requires closer scrutiny in terms of motivation to transfer, as well as expectancy, valence and instrumentality perceptions they may hold of the learnership (Landy & Conte, 2007). If learners' views regarding the motivation components of the training opportunity differ based on age levels, this knowledge could be used to develop interventions aimed at enhancing perceptions that could increase motivation to engage in the learning opportunity.

Gender was also linked to learnership performance by the interview respondents. Since female learners did appear to experience greater difficulty in simultaneously managing responsibilities at home and studying, it can be suggested that employers should consider providing additional support and consideration to them during the presentation of learnerships.

Lastly, a recommendation can be made regarding the finding that educational level was coupled to learnership performance scores. Learning opportunities should be created and/or presented on a continuous basis as it appears that the more people learn, the more they want to learn and the more successful they get at learning. The latter is not a unique finding, indeed it is a well established principle of training and development theory that this process is reciprocal (Landy & Conte, 2007).

In addition to the above-mentioned discussion of biographically-oriented themes, the qualitative component of the study also aimed to identify related factors that may have influenced individuals' learnership performance. In this regard, the following factors emerged from the basic individual interviews: *facilitator and group attributes*; *organisation support*; and *career planning*. Each of these themes will now be discussed in more detail.

5.2.2.2 Facilitator and group attributes

Research literature (e.g., Gauld & Miller, 2004) suggest that facilitator competencies such as building relationships with students and attending to individual differences of trainees are important to ensure effective training. This view was also reflected in the interviews used in the present research. A considerable portion of the participant group specifically mentioned that feeling comfortable with the facilitator, having a good relationship with the facilitator, and receiving individual attention from the facilitator, influenced their learnership performance.

Research findings from various studies (e.g., Coetzer, 2007; Kyndt et al., 2009) furthermore propose that certain elements of group dynamics may influence training performance. Again, in the present sample of interviewees, some participants referred to the encouraging influence a positive class atmosphere and companionship between class mates had on their learnership performance. The implications of these findings are that facilitators should be informed about the influence that their qualities and approach may have on individuals' learnership performance. In addition, facilitators involved in learnerships should not only be technical training experts, but should also be empowered with skills training that will enable them to create and manage class atmosphere and group climates that are conducive to learning.

5.2.2.3 Organisation support

A number of participants cited organisation support as having an influence on their learnership performance. The fact that their employer gave them the opportunity to partake in the learnership programme, together with issues such as management giving them time to prepare for class sessions, and even the support of their colleagues by standing in for them at work when required, appeared to influence participants' learnership performance. These statements can be linked to research literature such as Chiaburu and Tekleab's (2005) study, which found that a direct relationship existed between training motivation and an organisation culture of continuous-learning and supervisor support, respectively. In addition, Tannenbaum and Yukl (1992) suggested that a lack of support from managers and peers may act as a barrier to transfer of learning.

A further aspect of organisation support identified during the interviews was support during training to ensure that the day-to-day pressures of work did not become obstacles to learning transfer (Belling et al., 2004). The difficulty of having classes in the afternoon, during busy times, and/or after working evening shifts were highlighted by participants as having an influence on their learnership performance. Similarly, participants that were higher in seniority level within the organisation, and hence, had more responsibilities and/or subordinates reporting to them, found it difficult to concentrate during the classes, as they were contemplating their work responsibilities that were not being attended to whilst participating in the learnership.

A final theme that could be coupled to perceived organisation support, involved learners having the opportunity to apply what they have learned during the learnership training programme back in their jobs, which is traditionally referred to as *motivation to transfer*. In this view, transfer of training will occur only when learners have the motivation or desire to use the acquired knowledge and skills on the job (Baldwin & Ford 1988; Noe, 1986; Noe & Schmitt 1986; Wexley & Latham, 1991). The fact that the learnership programme focused on matters that learners encountered in the workplace on a daily basis, led participants to believe that it may have supported their learnership performance. On the other hand, some participants expressed frustration at not being able to implement new things that they had acquired on the learnership programme. Both of the above views are supported in the research literature. Holton et al. (1997), for example, supported the idea that training outcomes would be higher if employees get the opportunity to use and apply what they have learned. Similarly, Newstrom (1986) argued that a lack of reinforcement back on the job may act as a barrier to learning.

Several implications can be derived from the findings of the qualitative results. Firstly, employees in the present study appreciated, and attached great value to, training opportunities given to them by their employer. Furthermore, people tend to find learning experiences easier and more valuable if their employer was actively involved during the presentation of the learnership programme and, for example, showed consideration by regulating work schedules, workloads, and other aspects that could inhibit their learning performance. In summary, the implications associated with the organisation support theme suggest that organisations should get actively involved

during the implementation of learnerships (i.e., provide opportunities to participate in learnerships, assist employees during learnerships, and provide employees with the opportunity to apply what they have learned). Therefore, the present research makes a call for closer integration of learners' job roles with their learnership programmes, which implies that organisations (i.e., learners' line managers) should more actively plan the learnership opportunity in conjunction with learnership programme providers.

5.2.2.4 Career planning

A last theme obtained from the basic individual interviews that is worth pointing out involves career planning. In the present research, numerous participants indicated that they enrolled for the learnership because they felt it would help their career progress in the future. More specifically, several participants reported that they had been promoted or moved to more challenging positions since completing the learnership training programme. These observations correspond to research findings such as those of Noe and Schmitt (1986), which indicated that career planning and training motivation are positively correlated. The implication of this finding involves that learners should be encouraged and assisted to plan their careers. Employees that are seconded to learnership opportunities should be made aware of how training opportunities may assist them in enhancing their careers. If individuals can be provided with an explicit connection between the learnership and further career benefits, it may improve individuals' training motivation.

5.2.3 Synthesis of results

Overall, the results of the present research seem to suggest that biographical factors could relate to training performance, but normally, these relationships cannot be generalised without caution since they could be sample specific. For example, the quantitative results showed that only learners' educational level empirically predicted their learnership performance.

Moreover, the present investigation also showed that empirical and qualitative results do not necessarily concur, but could be used in conjunction since the consideration of both approaches provides a complementary understanding of the factors that affect learnership performance. For example, age and learnership performance were not

empirically related, but subjective perceptions of interviews did seem to suggest such a relationship.

The quantitative results did not support the hypothesis that learnership performance will, on average, be significantly higher for males. However, the qualitative results proposed that female learners experienced greater challenges in coping with their familial responsibilities at home while engaged in the learnership opportunity, e.g., when studying at home. The implication of the research results for local human resource development functionaries include that female learners' familial responsibilities should be taken into consideration when planning and presenting training programmes at work. In cases where female learners are the primary caregivers at home, they should be assisted and supported to deal with the combination of learning- and familial responsibilities.

In terms of education level, the quantitative and qualitative research results corresponded by showing that a positive relationship existed between educational level and learnership performance. In general, it is believed that this may result from employees with higher educational qualifications receiving more training opportunities (Renaud et al., 2006), having higher training motivation (Wagner & Flannery, 2004) and experiencing fewer social obstacles to educational participation (Devanney, 2009). Special efforts should be made to investigate and mitigate the social obstacles to educational participation that less educated learners may experience

With regards to predicting learnership performance from the set of biographical independent variables, the multiple regression results suggested that, when combined into a regression model, age, gender and educational level accounted for 11.5% of the total variance in learnership performance. Since learnership performance can be reliably predicted from biographical variable, human resource development practitioners could benefit from using such regression models to estimate future learners' vulnerability to poor performance on learnership programmes. This information could be used to classify learners into special supportive treatment programmes that receive closer performance monitoring and are targeted with additional supportive interventions.

The qualitative aspects of the present research study also leads to an important preliminary conclusion. When looking at the qualitative data, it seems as if the biographical variables may be proxies for other more significant psychological variables. Indeed, the situational nature of the interaction of these variables is clear. Hence, an alternative reason for the lack of ‘congruence’ may be related to the use of ‘weak’ predictors to account for other variables that may be influencing learnership performance – especially those highlighted by the additional themes generated from the qualitative interviews. In the present sample, participants’ subjective views could be categorized into a theoretical model of biographically related factors that affect learnership performance. In this case, facilitator and group attributes, organisation support and career planning were found to be factors affecting learners’ performance on a learnership in the South African fruit packing industry. It is suggested that these factors are further explored with empirical and qualitative research efforts.

5.3 Limitations of this study

Like all research studies, this study is subject to certain limitations. Firstly, the relative small sample size and industry-specific nature of the present sample restricts the generalisability of the research results. Future studies that utilise a bigger, wider sample would better reflect the total population of learnership participants in the South African labour market. In addition, a lack of sample variation, such as observed in the poor split in the gender variable (243 females to 97 males), may have confounded the correlation results. The full extent of the abovementioned possibility was only recognised during the data gathering and data cleaning phases of the study, when it became apparent that a large number of participants’ details and/or information were not captured accurately enough by the training provider to allow utilisation of the data in the research project.

In terms of statistical analysis, it should be stated that distributional characteristics in the data, such as skewness, could have affected the results. Although it is tempting to conclude that most inferential statistics are robust to violations of the assumption of normality, that conclusion may not be warranted (Tabachnick & Fidell, 1996). Bradley (as cited in Tabachnick & Fidell, 1996) reports that statistical inference

become less and less robust as distributions depart from normality, rapidly so under many conditions. And even when the statistics are used purely descriptively, normality, linearity, and homoscedasticity of variables enhance the analysis. In addition, Tabachnick and Fidell (1996) point out that regression and ANCOVA analyses reveal relationships among variables but do not imply that the relationships are causal. Demonstration of causality is a logical and experimental, rather than statistical, problem and an apparently strong relationship between variables could stem from many sources, including the influence of other, currently unmeasured variables (Tabachnick & Fidell, 1996). This point becomes particularly salient in the current set of research results. In the present study, biographical variables were related to learning performance in some cases, but one should not mistakenly conclude that these relationships are causal, firstly, and that ‘manipulating’ these indirectly through enhanced human resource development opportunities, would necessarily improve learners’ learnership performance. For instance, the presence of more complex causal mechanisms and/or constructs should be further explored, such as the possible mediating or moderating effects of motivation to transfer in relation to the effect of biographical variables such as age on learnership performance.

Other limitations of the study had to do with the operationalisation of the criterion variable. Research on learnership training programs are limited and, hence, studies in the research literature with psychometrically sound measures of learnership performance on learnership programmes are scarce. While training content, assessor training and assessment measures were standardised in the present study, three different assessors presented the learnership to different groups of participants. It would be entirely plausible to expect that learners’ exposure to different facilitators could have influenced participants’ test scores. Lastly, it should be acknowledged that, even though the researcher’s intent was to use test scores that participants obtained during first-time assessments, the data of first-time assessments where learners ‘failed’ were not captured accurately enough in practice. The accredited provider’s assessment policy proclaims a ‘pass mark’ of 60%, with learners getting three opportunities to pass on a specific assessment. If a learner obtained a score below 60% during a first-time assessment, but a score above 60% during a second or third time assessment, the learner would receive a maximum test score of 60%, irrespective of the results obtained during the second or third assessment. Imprecise

capturing of first-time assessment scores may have had an impact on the distribution of the criterion variable statistics, and hence, may have influenced conclusions drawn from the research results.

There were also a number of limitations related to the qualitative component of the research study. For instance, the basic individual interviews were only conducted at participant organisations in the Western Cape and with relatively few ($N = 20$) interviewees. Although the reasons for this limitation had to do with lack of adequate resources and cost-effective access for the researcher, only conducting the interviews in the Western Cape limits the ability to generalise the qualitative research results to other settings. Although this limitation is conceded, the qualitative component of this research was exploratory in nature and designed to supplement the quantitative results, leading to a number of valuable insights. In addition, it should be stated that the interviews were conducted with participants who completed the learnership in preceding years, and hence, were retrospective in nature. It could be considered by future studies to also obtain this type of information from participants *while* they are in the process of completing the learnership opportunity.

5.4 Recommendations for future research

A number of recommendations can be drawn from the study. Firstly, the present research has shown that learners' biographical characteristics could systematically relate to their learnership performance. In particular, the role of learners' educational level can be useful to predict learnership success. However, it appears that these biographical characteristics may also covary among themselves, leading to the conclusion that interactions between biographical variables should also be investigated for their ability to predict learner performance. For instance, the magnitude of the correlation between education level and age may warrant more in-depth research investigation into the relationship between an interaction term created from these variables and learnership performance should be explored. Results of more in-depth investigations into these relationships may assist in determining how learnership performance is caused by learners' biographical characteristics. However, this view could also be criticised. It is perhaps more sensible to view biographical

predictors of learnership performance as useful in modelling context-specific learnership performance, thereby pointing to possible related factors that may be affecting learners' success. Some of the biographical variables, for example, seem to be proxies for more complex psychological phenomenon (e.g., age seems to be related to levels of confidence, etc.) and the observed relationships with learnership performance may allude to something more difficult to identify without going into psychological constructs. From a theoretical standpoint, it is much more difficult to find a persuasive argument why biographical characteristics should affect learner performance. Hence, biographical factors would probably find greater utilisation by practitioners wanting to better predict important training outcomes and identify 'red flags' early that may affect their learners' success, than academics interested in the theoretical models that explain how learning performance results.

In addition, more should be done in terms of future research to explore the social obstacles that people may face when it comes to participation in education activities. Future research could provide valuable recommendations about how these social obstacles can be addressed and eradicated. Special consideration should here be given to people with low educational levels and learners that carry the primary caregiver responsibility at home.

It is further recommended that more research be conducted to investigate learnerships as a training instrument per se. A better understanding of the benefits and/or drawbacks associated with learnerships will enable more effective utilisation (e.g., better management) of this training tool. Research activities seeking to create a more accurate or valid measure of learnership performance on learnership programmes may also be of benefit, especially if it could integrate performance measures of the theoretical – and practical learnership components in a constructive way.

Lastly, in view of the fact that the study also aimed to further explain factors that influence learnership performance on learnerships by means of a qualitative component, it is suggested that the factors of facilitator and group attributes, organisation support, and career planning be included in future models seeking to predict learnership performance. Further research regarding the above could assist in identifying exactly what facilitators should do in terms of individual attention and emotional support to enable learners to achieve optimal learnership performance.

Similarly, inclusion of organisation support into a model seeking to predict learnership performance may assist in specifying exactly what employers or organisations could do in terms of issues such as providing training opportunities, active involvement during learnerships, and giving employees opportunities to apply what they have learned in learnership programmes. A natural extension of this line of research would involve investigations that examine the causal relationships between these variables and learnership performance.

5.5 Conclusion

The purpose of the study was to explain learnership performance from individuals' biographical characteristics. Due to the paucity of research on learnership success in the South African labour market, this research was deemed highly relevant. Research literature indicated that a negative relationship would exist between age and learnership performance, males would achieve higher learnership performance scores than female learners, and learners with higher educational levels would do better on these programmes. Quantitative and qualitative research designs were utilised to investigate the stated hypothesised relationships. As was seen from the above discussion, not all of the hypotheses were supported.

In terms of research implications, the quantitative research findings of a statistically significant positive relationship between educational level and learnership performance reiterate the central importance of education in learning performance and, hence, the importance of educational and training institutions in providing productive employees for the South African workforce. Although drawing exaggerated conclusions from the qualitative research must be guarded against, it is interesting to note that the quantitative and qualitative components of the research study produced contradictory results regarding the relationship between demographic factors and learnership performance, which points to the possibility that perceptions and reality relating to the factors that affect training performance may be far removed. Further research into these relationships, specifically in a South African context, may be of value. Themes that could be addressed in this regard include research into how female learners, and learners with lower educational levels, could be assisted to cope with the social obstacles they face in terms of participation in education. Moreover, research should explore effective means of increasing learnership performance for

these categories of learners by means of alternative mechanisms that may mediate or moderate their relationships to performance, such as learning motivation or motivation to transfer.

In addition, it is suggested that further research be undertaken to investigate the relationships between learnership performance and demographically-related factors such as facilitator and group attributes, organisation support, and career planning, as identified in the basic individual interviews in the present research. Research investigating what exactly facilitators should do when providing individual attention and emotional support to learnership learners may be of benefit. Similarly, more research could be done to determine precisely what employers can do before, during, and after learnerships to ensure that learners achieve optimal learnership performance.

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APPENDICES

APPENDIX A: PROGRAMME OUTLINE OF THE NATIONAL CERTIFICATE: FRUIT PACKING AND GRADING PROCESSES (NQF3) LEARNERSHIP



All qualifications and unit standards registered on the National Qualifications Framework are public property. Thus the only payment that can be made for them is for service and reproduction. It is illegal to sell this material for profit. If the material is reproduced or quoted, the South African Qualifications Authority (SAQA) should be acknowledged as the source.

**SOUTH AFRICAN QUALIFICATIONS AUTHORITY
REGISTERED QUALIFICATION:**

National Certificate: Fruit Packing and Grading Processes

SAQA QUAL ID	QUALIFICATION TITLE		
48848	National Certificate: Fruit Packing and Grading Processes		
ORIGINATOR		REGISTERING PROVIDER	
SGB Secondary Agriculture: Processing			
QUALITY ASSURING ETQA			
AgriSETA - Agriculture SETA			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	Field 01 - Agriculture and Nature Conservation	Secondary Agriculture	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	120	Level 3	Regular-Unit Stds Based
REGISTRATION STATUS	SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE
Reregistered	SAQA 0160/05	2007-08-07	2010-08-07
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT	
2011-08-07		2014-08-07	

This qualification does not replace any other qualification and is not replaced by any other qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION

This qualification is registered at level 3 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in broad fruit packing and grading processes and practices, namely receiving, handling, packing, storing, grading and dispatching of fruit and provides opportunity for learners to grow in this specific field.

The learner will be able to integrate supervisory knowledge and skills with those specific to the fruit packing industry, ensuring the business they operate in is running smoothly. It also enables the learner to use competencies, which will facilitate growth of the business.

The qualification focuses on the skills, knowledge, values and attitude required to progress further in the industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers. This qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Rationale for the qualification:

This qualification is aimed at people who are working in the fruit packing industry or who would like to start a career in the industry. It is aimed at formalising the skills required in the fruit packing industry to facilitate career pathing and to provide access to new entrants. Learners at lower levels will obtain the necessary skills and competencies through skills programs. The qualification provides learners with access to advanced learning in specialised areas within the fruit packing and processing industry. It also provides learners with the necessary background knowledge and skills to be portable within other industries.

Through the above the qualification will address one of the key priorities of the Department of Labour in the reduction of unemployment and under employment. It will assist in creating job opportunities and to create a better nation at large.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

Learners would be able to demonstrate competence in languages, communication and numeracy at NQF level 2 or equivalent.

Recognition of Prior Learning (RPL):

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Where RPL is required the learner will need to prove competence in that specific area in order to obtain recognition of that skill and knowledge.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practise and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

RECOGNISE PREVIOUS LEARNING?

Y

QUALIFICATION RULES

To obtain this qualification all fundamental and core unit standards are compulsory. The learner must select a minimum of 10 credits from the elective category to total 120 credits.

EXIT LEVEL OUTCOMES

1. Show an understanding of product characteristics and basic requirements of specific customer needs in the fruit industry considering the fruit handling protocols.
2. Demonstrate the ability to operate fruit packing machinery.
3. Show an understanding of the necessity for the application of environmental, hygiene, safety and health practices in the fruit handling process.
4. Demonstrate an understanding of the fruit flow process from receiving, packing, storage and dispatching of the product.

5. Demonstrate an understanding of the pre-sorting, grading and packing of fruit in the light of customer needs.

6. Demonstrate the ability to coordinate the packing and grading processes according to packing programmes and grading standards.

ASSOCIATED ASSESSMENT CRITERIA

1.
 - Factors impacting on the marketing of the product are identified and explained.
 - Principles of fruit handling protocol are implemented.
 - Cold chain processes and factors impacting on storage and preservation of fruit are described and explained.
 - Reasons and consequences of not taking cognisance of customer requirements regarding the quality of fruit are identified and applied.
2.
 - Machinery is prepared, maintained and used according to manufacturers specifications and work site procedures.
 - Consequences of not adhering to work site procedures and manufacturers specifications are understood and explained.
 - Records and reports are completed according to work site procedures and explained accordingly.
3.
 - Reasons and consequences for the use of environmental, hygiene, safety and health practices in the workplace explained.
 - Consequences of non-compliance understood in terms of customer and statutory requirements.
 - Records and reports are completed according to work site procedures and explained accordingly.
4.
 - Reasons for records and reports regarding the taking of fruit samples are explained.
 - Consequences for not storing and dispatching fruit according to work site procedures are explained.
 - Reasons for communicating deviations and fruit standards to relevant parties are explained.
 - Consequences of not adhering to customer requirements during whole fruit flow process are explained.
5.
 - Reasons and consequences of not taking cognisance of customer requirements regarding the quality of fruit are identified and applied.
 - Factors impacting on handling of the product explained.
 - Principles of fruit sorting, grading specifications and packing procedures are understood and implemented.
 - Records and reports are completed according to work site procedures and explained accordingly.
6.
 - Workplace is prepared, according to customers` requirements and work site procedures.
 - Consequences of not instructing work teams on grading and packing specifications explained.
 - Records and reports are completed according to work site procedures and explained accordingly.

Integrated Assessment Criteria:

Unit standards associated with this qualification must be used to assess specific and critical cross-field outcomes. Assessment should focus in an integrated way on determining the competence of the learner in terms of the overall purpose and title of this qualification.

The term integrated assessment also implies that the theoretical and practical components should be assessed together and assess combinations of practical, applied, foundational and reflective competencies.

Assessment activities should be done in real workplace situations and where simulations or role-plays are used, there should be supporting evidence to show that the learner is able to display the competencies to the real work situation.

All assessments should be conducted in line with the following documented principles of assessment:

appropriateness, fairness, manageability, integration into work of learning, validity, direct, authentic, sufficient, systematic, open and consistent.

Learners wishing to be assessed will need to provide evidence of the following:

- Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.
- Documentation and explanation of administrative records completed during the process of receiving, sampling, storing and dispatching of fruit.
- Demonstrations of a range of actions in handling of fruit and applying general safety in the workplace.
- A portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner, which may include production and quality data.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

INTERNATIONAL COMPARABILITY

Comparisons were done against unit standards and qualifications in the New Zealand and Australian Qualifications Authority. These were:

The "National Certificate in Horticulture (Fruit Production) Level 3" (New Zealand) allows the learner to choose elective unit standards in domains that are comparable to what is required for this qualification. The "National Certificate in Food and Related Production Processing Level 3" allows the learner to choose certain elective unit standards in domains that are related to what is required for this qualification.

Certificate I in Agriculture (Production Horticulture) - Australia- contains certain elements that may act as reference points for this qualification although the focus is on the growing of fruit.

A comparison of the above qualifications was undertaken and the best practice points were highlighted and used in the generation of this qualification's unit standards.

In general this qualification and its component unit standards were compared with their international counterparts and the differences are in the formatting, titles and scope of coverage or focus.

ARTICULATION OPTIONS

This qualification lends itself to both vertical and horizontal articulation possibilities. These possibilities ensure both mobility and progression for the learner in other fields of learning such as fruit liquefying industry and areas where supervisory competence is required. The learning areas outlined in the purpose of the qualification indicate the vertical articulation possibilities.

Horizontal and Vertical articulation possibilities:

- National Certificate: Seed Processing and Packaging at NQF Level 3
- Further Education and Training Certificate: Tobacco Services at NQF Level 4

MODERATION OPTIONS

Moderation includes internal and external moderation of assessments. Internal and external moderation systems must ensure that all assessors produce assessments that are credible, fair, reliable, consistent, adequate and practical.

Internal and external moderation systems must provide learning opportunities that are transparent, affordable and enhancing development in the field and sub-field of the National Qualifications Framework.

The accredited provider with the relevant ETQA must be able to provide internal moderation.

External moderation will be done by the relevant ETQA at its discretion.

UNIT STANDARDS:				
	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	115190	Demonstrate an understanding of the basic requirements of different fruit markets	Level 2	5
Core	115187	Explain product characteristics	Level 2	4
Core	115176	Explain the cold chain process	Level 2	4
Core	115193	Grade fruit	Level 2	5
Core	115178	Pack fruit	Level 2	5
Core	115179	Palletise fruit	Level 2	4
Core	115200	Dispatch final product	Level 3	8
Core	115195	Monitor fruit treatment process	Level 3	8
Core	115202	Operate fruit packing line machine	Level 3	10
Core	115180	Operate fruit sizing machine	Level 3	8
Core	115201	Receive fruit	Level 3	5
Core	115197	Store fruit	Level 3	8
Fundamental	8968	Accommodate audience and context needs in oral communication	Level 3	5
Fundamental	9010	Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	8969	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5
Fundamental	8973	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	8970	Write texts for a range of communicative contexts	Level 3	5
Elective	115188	Apply environmental protection procedures	Level 2	4
Elective	115181	Apply hygiene procedures	Level 2	4
Elective	115186	Apply safety and health procedures	Level 2	6
Elective	115177	Pre-sort fruit	Level 2	3
Elective	8000	Apply basic business principles	Level 3	9
Elective	115182	Operate carton assembly machinery	Level 3	8
Elective	115191	Perform quality tests on fruit	Level 3	8
Elective	10135	Work as a project team member	Level 4	8

APPENDIX B: LEARNERSHIP BIOGRAPHICAL INFORMATION FORM

LEARNERSHIP INFORMATION FORM

1.1 Name:

1.2 Surname:

1.3 Date of birth:

1.4 Identity Number:

1.5 Gender: Male Female

1.6 Disabled: Yes No

1.7 Race: Black Indian Coloured White

1.8 Home address:

1.9 Postal address:

1.10 Tel. Nr:

1.11 South African citizen: Yes No

1.12 Home language:

1.13 Highest qualification:

1.14 Have you been in the service of your employer before the commencement of this agreement? Yes No

1.15 If you have been employed, kindly indicate for how long:

1.16 If you have been employed, when did you start working at your employer?

1.17 Have you been on a learnership previously? Yes No

1.18 If "yes", please specify:

APPENDIX C: CONSENT FORM TO PARTICIPATE IN RESEARCH

STELLENBOSCH UNIVERSITY **CONSENT TO PARTICIPATE IN RESEARCH**

Biographical predictors of Learnership performance in the South African Fruit Packing industry

You are asked to participate in a research study conducted by Nicholaas Singleton who holds a BComm (Honours) from the Department of Industrial and Organisational Psychology at Stellenbosch University. The results will contribute to a Masters thesis. You were selected as a possible participant in this study because you recently completed the learnership National Certificate: Fruit Packing and Grading Processes (NQF3).

1. PURPOSE OF THE STUDY

The purpose of the research is to investigate the ability to predict Learnership performance from learners' biographical characteristics.

2. PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following:

2.1 PARTICIPATE IN AN INTERVIEW

Participate in a basic individual interview to assist in identifying possible factors that positively or negatively influence learners' Learnership performance on learnerships. In the interview, you will be asked to share your experiences related to the learnership National Certificate: Fruit Packing and Grading Processes (NQF3) with us.

3. POTENTIAL RISKS AND DISCOMFORTS

There are no potential risks or discomforts envisaged in this study.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Society will benefit from the research exercise as the research project will contribute to the management of learnerships in the South African Fruit Packing industry by identifying factors that promote and adversely affect Learnership performance in learnerships.

5. PAYMENT FOR PARTICIPATION

No payment will be made to participants neither will incentives be offered.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of a reference number assigned to the notes made on the interview. In other words, your name will not appear anywhere. Data will be securely stored at the Department of Industrial and Organisational Psychology, University of Stellenbosch and only my Supervisor and I will have access to the data.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The researcher may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me, Nicholaas Singleton (Principal Researcher) on 072 770 6950 or Mr. Francois de Kock on 021-8083016.

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Mr. Francois de Kock on 021-8083016.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE
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The information above was described to [*me/the subject/the participant*] by [*name of relevant person*] in [*Afrikaans/English/Xhosa/other*] and [*I am/the subject is/the participant is*] in command of this language or it was satisfactorily translated to [*me/him/her*]. [*I/the participant/the subject*] was given the opportunity to ask questions and these questions were answered to [*my/his/her*] satisfaction.

[*I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.*].

Name of Subject/Participant

Name of Legal Representative (if applicable)

Signature of Subject/Participant or Legal Representative

Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ [*name of the subject/participant*] and/or [his/her] representative _____ [*name of the representative*]. [*He/she*] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other*] and [*no translator was used/this conversation was translated into _____ by _____*].

Signature of Investigator

Date

APPENDIX D: INTERVIEW CHECKLIST AND INFORMATION RECORDING SHEET

Research Project:

Biographical predictors of Learnership performance in the South African Fruit Packing industry

Item: Basic Individual Interview Form
Participant:
Place of interview:
Date:
Time:
Interview checklist:

Interview item	Done
'Entry' done correctly	
Informed consent form completed	
'Exit' done correctly	

Thumbnail sketch of the respondent and interview situation

.....

Any unusual circumstances

.....

Anything disruptive that happened during the interview

.....

Personal feelings and/or anything that was suspected

.....
.....
.....

Examples of probes: three – to five-second pauses, nonverbal communications (e.g., eye contact), repeating questions and asking neutral questions.
Examples of neutral questions: “Any other reasons?” “Can you tell me more about that?” “How do you mean?” “Could you explain more for me?”

Interview questions:

- (a) How did you experience the learnership?

(b) Share with me the obstacles that you experienced during the learnership and everything that went along with it?

(c) What factors would you say helped you to perform well on the learnership?

A large, empty rectangular box with a thin black border, intended for the respondent to write their answer to the question above. The box occupies most of the page's vertical space below the question.