

TECHNICAL SKILLS AND KNOWLEDGE TRANSFER FOR AN AGING WORKFORCE IN THE AUTOMOTIVE INDUSTRY

By

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TECHNICAL SKILLS AND KNOWLEDGE TRANSFER FOR AN AGING WORKFORCE IN THE AUTOMOTIVE INDUSTRY

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I, Gaven Mahlalela 212434519 hereby declare that:

- The work that is contained in this treatise is my own original work, except as indicated in the acknowledgements, text and the reference list;
- The work submitted is in partial fulfilment of the Master's in Business Administration degree at the Nelson Mandela University Business School; and
- This treatise has not been previously submitted in full or partial fulfilment for the requirements for an equivalent or higher qualification at any other recognised education institution;
- However, material from publications by the student may be embodied in the treatise.



07 March 2022

Gaven Mahlalela

Date

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This statement has been so true for my MBA journey, and I would like to express my gratitude to the following people:

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ABSTRACT

This study highlighted the importance of technical skills, knowledge transfer and its drivers. Organisations face a dilemma when incumbent tacit knowledge owners vacate employment without transferring invaluable intellectual property to other stakeholders (Khumalo, 2012). Once this knowledge is lost, it may be impossible to recover and difficult to hide from competitors (De Long, 2004).

Knowledge transfer among employees is a critical enabler of organisational learning. In the context of the South African automotive industry, the volatility of the industry has seen many Original Equipment Manufacturers (OEM) and their suppliers shedding jobs. Furthermore, the replacement of the old automotive training board by the Sector of Education and Training (SETA) has created more complex challenges. Automotive companies are struggling to absorb the financial burden that comes with training skills transfer, due to the reduced workforce that is overloaded by work to cope in the current economic climate.

The drivers of technical skills and knowledge transfer were investigated in a particular automotive company in Port Elizabeth, South Africa. A mail survey was directed to 168 technical employees in an automotive manufacturing plant. The survey tested the dependent variable (technical skills and knowledge transfer), and independent variables were its drivers (management of scarce skills, succession planning, trainee characteristics, training design and work environment). The survey had 50 questionnaire items. Statistical analysis was used to analyse the research questions through descriptive statistics, Pearson correlation and multiple regression analysis.

The empirical results found that all of the independent variables showed positive correlations with the dependent variable, however succession planning, followed by work environment showed the most significant relationship with technical skills and knowledge transfer in an automotive organisation.

TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENTS.....	iii
ABSTRACT	iv
LIST OF FIGURES.....	ix
LIST OF TABLES	x
CHAPTER 1: SCOPE OF THE STUDY	1
1.1 INTRODUCTION.....	1
1.2 PROBLEM STATEMENT	2
1.3 DELIMITATION OF THEORETICAL CONSTRUCTS	4
1.4 THEORETICAL / CONCEPTUAL FRAMEWORK.....	5
1.4.1 Hypotheses.....	6
1.5 PURPOSE / RATIONALE / CONTRIBUTION OF THE STUDY	6
1.6 RESEARCH QUESTIONS.....	7
1.7 RESEARCH OBJECTIVES	8
1.7.1 Primary research objective	8
1.7.2 Secondary research objectives.....	8
1.8 RESEARCH DESIGN AND PARADIGM	8
1.8.1 Research approach	9
1.8.2 Sampling design	9
1.8.3 Data collection instrument and administration	10
1.8.4 Research ethics protocol	10
1.8.5 Data analysis	11
1.8.6 Descriptive statistics	11
1.8.7 Inferential statistics	11
1.8.8 Reliability test	12
1.8.9 Validity test	13
1.9 REPORTING OR SYNTHESIS	13
1.10 TREATISE STRUCTURE	13
1.10.1 Chapter 1	14
1.10.2 Chapter 2	14
1.10.3 Chapter 3	14

1.10.4	Chapter 4	14
1.10.5	Chapter 5	14
CHAPTER 2: LITERATURE REVIEW		15
2.1	INTRODUCTION.....	15
2.2	DEFINITION OF KNOWLEDGE TRANSFER.....	16
2.2.1	Explicit knowledge	16
2.2.2	Tacit knowledge.....	16
2.2.3	Ambiguous knowledge.....	17
2.2.4	Knowledge transfer.....	18
2.2.5	Organisational knowledge transfer	18
2.3	ANTECEDENTS AND OUTCOMES OF KNOWLEDGE TRANSFER.....	19
2.3.1	Antecedents of organisational knowledge transfer	19
2.3.2	Outcomes of organisational knowledge transfer.....	20
2.3.3	Antecedents of knowledge transfer	21
2.3.4	Recent studies on trust and culture as an enabler of knowledge transfer 22	
2.3.5	Outcomes of knowledge transfer	23
2.4	KNOWLEDGE RETENTION.....	24
2.4.1	Knowledge retention	24
2.5	SUCCESSION PLANNING.....	26
2.5.1	General overview of succession planning.....	26
2.5.2	Coaching and mentoring.....	27
2.5.3	Succession planning benefits	30
2.5.4	Succession planning and tacit knowledge transfer	30
2.6	TRAINING TRANSFER	31
2.6.1	Training transfer factors.....	31
2.6.2	Trainee characteristics.....	31
2.6.3	Training design	33
2.6.4	Work environment	34
2.7	SUMMARY.....	36
CHAPTER 3: METHODOLOGY.....		38
3.1	INTRODUCTION.....	38
3.2	RESEARCH PARADIGMS	38
3.2.1	Positivism	38

3.2.2	Interpretivism	39
3.2.3	Critical theory.....	39
3.2.4	Positivism vs. Interpretivism	40
3.3	RESEARCH APPROACH.....	41
3.3.1	Quantitative Research	42
3.3.2	Qualitative Research	42
3.3.3	Participatory Research	42
3.3.4	Quantitative vs. Qualitative Research.....	42
3.4	DATA COLLECTION METHOD	44
3.4.1	Constructing the questionnaire/survey	44
3.5	POPULATION AND SAMPLING DESIGN	46
3.6	ETHICAL ISSUES	48
3.7	DATA ANALYSIS METHOD.....	49
3.7.1	Descriptive statistics	49
3.7.2	Inferential statistics	49
3.7.3	Pearson Correlation.....	49
3.7.4	Multiple Regression Analysis.....	50
3.7.5	Multi-collinearity	51
3.7.6	Reliability test	51
3.8	METHOD OF REPORTING AND SYNTHESIS	53
3.9	PRESENTATION OF DEMOGRAPHICAL INFORMATION	53
3.9.1	Demographics	53
3.10	SUMMARY	57
CHAPTER 4:	DESCRIPTIVE AND INFERENTIAL STATISTICS	58
4.1	INTRODUCTION.....	58
4.2	DESCRIPTIVE STATISTICS	58
4.3	TECHNICAL SKILLS AND KNOWLEDGE TRANSFER	60
4.4	DRIVERS OF TECHNICAL SKILLS AND KNOWLEDGE TRANSFER	62
4.4.1	Management of scarce skills	62
4.4.2	Succession planning.....	64
4.4.3	Trainee characteristics.....	65
4.4.4	Training design	66
4.4.5	Work environment	67
4.5	INFERENTIAL STATISTICS.....	70

4.5.1	Pearson Correlation Test.....	70
4.5.2	Multiple Regression Analysis.....	70
4.5.3	Multi-collinearity Test.....	72
4.6	SUMMARY.....	73
CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS		74
5.1	INTRODUCTION.....	74
5.2	DISCUSSION.....	74
5.2.1	Research Question 1	75
5.2.2	Research Question 2	75
5.2.3	Research Question 3	76
5.2.4	Research Question 4	76
5.2.5	Research Question 5	76
5.2.6	Regression and Correlation Analysis.....	77
5.3	ACCEPTANCE OR REJECTION OF THE HYPOTHESES	78
5.4	RECOMMENDATIONS.....	79
5.4.1	Recommendations to management.....	79
5.4.2	Recommendations to the organisation and the Human Resource Department	80
5.4.3	Recommendations to trainee and mentor.....	80
5.4.4	General recommendations	81
5.5	LIMITATIONS OF THE STUDY	81
5.6	FUTURE RESEARCH	82
5.7	CONCLUSION	82
REFERENCES.....		84
APPENDIX 1: ETHICS CLEARANCE		96
APPENDIX 2: THE COVER LETTER OF THE QUESTIONNAIRE		97
APPENDIX 3: QUESTIONNAIRE		98
APPENDIX 4: TURN-IT-IN ORIGINALITY REPORT.....		102
APPENDIX 5: PERMISSION TO SUBMIT TREATISE FORM		103

LIST OF FIGURES

Figure 1.1: Proposed theoretical/conceptual framework of drivers/strategies of technical skills and knowledge transfer	6
Figure 2.1: The Model of Knowledge Retention	25
Figure 3.1: Gender (n=168).....	53
Figure 3.2: Age and Gender (n=168)	54
Figure 3.3: Qualification level (n=168).....	54
Figure 3.4: Occupational level (n=168)	55
Figure 3.5: Tenure and Qualification (n=168).....	56
Figure 3.6: Tenure and Age (n=168)	56
Figure 4.1: Average responses per variable (n=168)	58
Figure 4.2: Distribution of responses per variable (n=168).....	59
Figure 4.3: Technical Skills and Knowledge Transfer responses per department....	61
Figure 5.1: Technical Skills and Knowledge Transfer Model.....	78

LIST OF TABLES

Table 1.1: Theoretical Constructs	4
Table 3.1: Quantitative VS. Qualitative Research	43
Table 3.2: Rule of thumb - Correlation Coefficient	50
Table 3.3: Interpretation intervals for Cronbach's Alpha.....	52
Table 3.4: Cronbach's Alpha - Reliability of the measuring instrument (n=168)	52
Table 3.5: Department (n=168)	57
Table 4.1: Technical Skills and Knowledge Transfer Item.....	60
Table 4.2: Management of Scarce Skills Item	62
Table 4.3: Succession Planning Item	64
Table 4.4: Trainee Characteristics Item.....	65
Table 4.5: Training Design Item	67
Table 4.6: Work Environment Item	68
Table 4.7: Pearson Correlation Test (n=168)	70
Table 4.8: Multiple Regression Analysis on Hypothesised Conceptual Framework (n=168).....	71
Table 4.9: Multi-collinearity Test (n=168)	72

CHAPTER 1

SCOPE OF THE STUDY

Technical Skills and Knowledge Transfer for an Aging Workforce in the Automotive Industry

1.1 INTRODUCTION

In the current automotive manufacturing environment, the focus is changing from that of product qualities to how organisations attract knowledge workers who add value to their assets and business (Khumalo, 2012). This is mainly driven by a societal shift from that of the industrial age to the capital age. Experts such as Singh and Premarajan (2007) refer to this as the era of the knowledge worker. Organisations have started competing based on the skills and talents of their employees and have discovered that by attracting and retaining the best and brightest employees, higher market share and profits can be achieved (Khumalo, 2012). According to Song and Chermach (2008), intellectual capital consists of experience and knowledge of every employee in the organisation. The core competency of organisations in this era focuses on how an organisation attracts, selects, engages, develops and retains employees.

Organisations face a dilemma when incumbent tacit knowledge owners vacate employment without transferring invaluable intellectual property to other stakeholders (Khumalo, 2012). Singh and Premarajan (2007) postulate that when an employee leaves an organisation, all of the knowledge, networks and general skills they acquired also leave the organisation. Once this knowledge is lost, it may be impossible to recover and difficult to hide from competitors (De Long, 2004). Failure to curb the leakage of organisational knowledge can inhibit competitive advantage and stifle organisational agility. If not corrected, lost knowledge can also curtail marketing efforts and lower profit margins (De Long, 2004).

There has been much research in this field of training, skills and knowledge transfer, however, the findings coincide with the age gap and aging work force and are not specifically focused on technical skills or hard skills. For example, research by Botke,

Jansen, Khapova and Tims (2018) studied factors influencing the transfer stages of soft skills and research by Anastakis et al. (1999) focused on technical skills transfer using bench models in early residents' surgical education. The results showed a seven to ten percent over the manual control group.

This study is aimed at providing a management solution by determining key knowledge management drivers required for promoting adequate technical skills and tacit knowledge transfer. The limited resources as defined by this study are the experienced workforce or employees with high levels of tacit knowledge pertaining to the technical knowledge required in organisations. Focus is aimed at retaining critical knowledge in aging organisations to enhance continuity, innovation and competitiveness in their respective industries.

1.2 PROBLEM STATEMENT

There are inadequate skills and knowledge transfer to new generation employees in a particular automotive company based in Port Elizabeth, South Africa. The older generation of technical employees or experts with 20 to 40 years of experience rapidly exit the company at retirement without transferring their expertise, skills and knowledge to the younger or new employees. This has negatively impacted the automotive company as it suffers huge financial losses due to machine downtime, poor process capability, high scrap rate, project delays and emergency call-out fees for experts to resolve issues. Laker and Powell (2011) define training transfer as the degree to which what is taught in training is applied at work and improves work-related performance and consequently organisational outcomes. This is supported by the study conducted by Babkina (2014) on training transfer improvement at an organisational level, focusing on human resource development functions. The author further contends that the lack of ability to transfer training will result in a costly waste of energy, time and money.

For the past few years, in the automotive company where this study was conducted, several retired employees were called back on a temporary or short-term contract basis to assist in various departments. They were tasked to assist these departments to fulfil their commitments and business objectives. Short-term contracts are more

costly than regular full-time employee rates and do not include a clause for knowledge transfer. As a result, many consultants enter organisations, deliver work and leave again without a long-lasting impact.

In the past six years, from about 2015 to 2021, the automotive company as the focus of this study, experienced huge technical skills loss through the retirement of experienced technical employees. These technical roles include fitters, artisans, technicians, millwrights, electricians, toolmakers, process engineers and quality engineers. The company has a lot of machinery which are heavily reliant on maintenance, engineering and technical support personnel to operate efficiently. These technical skills are swiftly becoming scarce in the entire automotive industry, due to technological advancements. The biggest concern regarding these experienced employees leaving the company is that there are no direct replacements readily available or highly skilled enough to step into these roles. The generational gap between the younger and older employees is big and it creates barriers for knowledge transfer, as the tertiary curriculum and bench training has evolved and changed over the years.

Rothwell and Poduch (2004) argue that technical succession planning is not just about finding replacements, but rather about developing talent from within, building appropriate bench strength and preserving the company's institutional knowledge which is encrypted and stored in the minds of veteran employees at every level of the organisation. Kim (2003) indicates that a lot of organisations are struggling with employee age gaps as a result of retrenchments or downsizing and hiring freezes. Subsequently, most of these companies have discovered that their employee population consists of a huge number of employees with less than 15 years' experience and a large number who will retire within the next 15 years.

Inadequate skills transfer and its barriers continue to be major issues in the automotive industry and if these are not resolved, organisations will find themselves recruiting more expensive employees and consultants in an attempt to bridge the skill gaps that exist, ultimately resulting in poor business continuity and huge financial losses. It is imperative that organisations address this issue of inadequate technical skills transfer by ensuring that institutional knowledge and skills are retained within the organisation.

Adequate technical skills and training transfer will result in less business interruptions, an increased learning curve amongst employees especially regarding problem solving and decision making, reduced use of highly expensive consultants or experts, reduced project delays, increased machine uptime, reduced changeover time, reduced scrap and improved production efficiency and productivity. There is a host of other benefits which can be achieved by resolving this problem, which is directly related to the engagement of the workforce.

1.3 DELIMITATION OF THEORETICAL CONSTRUCTS

Theoretical constructs relevant to this study include knowledge transfer, knowledge retention, transfer of training, management of scarce skills, succession planning, trainee characteristics, training design and work environment. Some of these references might appear old, however they refer to seminal authors who originally coined the concepts.

Table 1.1: Theoretical Constructs

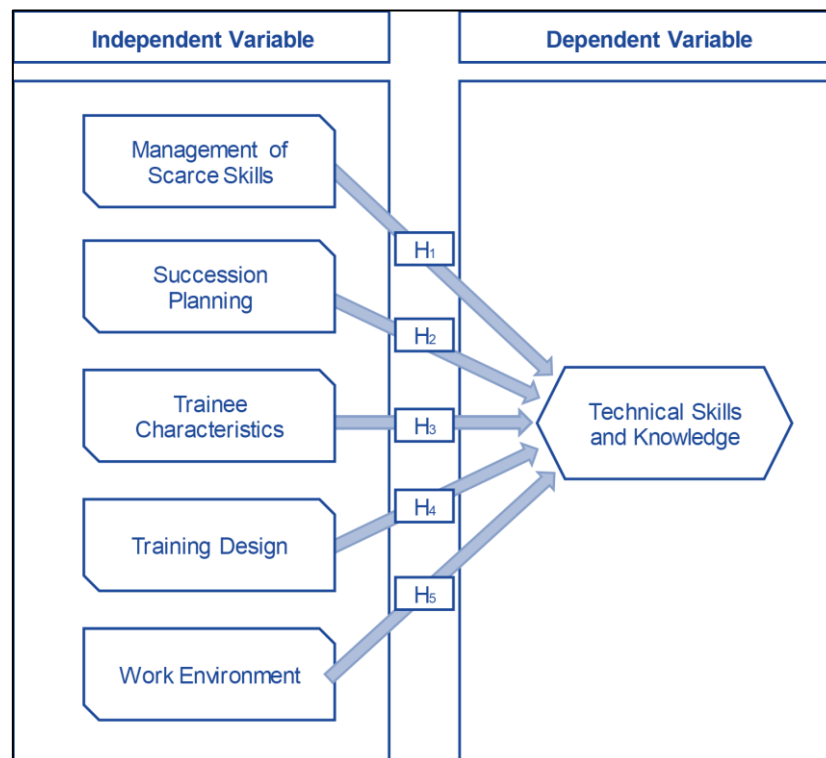
Key Factor	Definition / theoretical construct
Tacit knowledge	Tacit knowledge is what an individual knows from experience or from cognition, hence it is implicit and ambiguous. Tacit knowledge is knowledge that cannot be articulated or verbalised: 'We know more than we can tell'. An individual uses this acquired knowledge to perform a task or set of tasks (Polany, 1966).
Explicit knowledge	Explicit knowledge is unambiguous information that can easily be documented and arranged, such as that which is compiled in training manuals and archived. Unlike tacit knowledge, explicit knowledge can be shared easily (Coakes, 2004).
Knowledge transfer	A process which is used by an organisation to recreate existing knowledge in a new setting (Singh & Premarajan, 2007).
Knowledge retention	Knowledge retention involves entrenching knowledge in a storehouse, so that it exhibits a degree of persistence over time. Implementing knowledge management techniques which include capturing, transferring and retaining, is necessary and required in every organisation (Argote, 2012).
Transfer of training	Training transfer is the extent to which people efficiently demonstrate knowledge, skills, attitudes and behaviours attained during training of a particular task (Holton, 1996).

Key Factor	Definition / theoretical construct
Management of scarce skills	The requirement of critical, scarce and core skills outweigh the amount of available talented individuals (Mabuza & Proches, 2014).
Succession planning	Succession planning is defined as a formal and precise exertion by a business to ensure organisational and leadership continuity in essential positions. This type of effort is focused on retaining and developing intellectual and capital knowledge for the future of the organisation, aimed at motivating leaders to improve performance (Rothwell, 2011).
Trainee characteristics	Training characteristics focus on cognitive ability, self-efficacy, motivation and perceived utility of training (Burke & Hutchins, 2007).
Training design	Design and delivery of training programs strongly affect learning and eventually transfer outcomes. Furthermore, behavioural modelling, error management and realistic training environments have solid relationships with the transfer of learning (Grossman & Salas, 2011).
Work environment	The transfer climate, support, opportunity to perform and follow-up are critical components of the work environment. Training programs that are delivered effectively will fail to yield positive training transfer outcomes when the work environment does not inspire the use of the required behaviours (Salas, Wilson, Priest & Guthrie, 2006).

1.4 THEORETICAL / CONCEPTUAL FRAMEWORK

Research conducted on knowledge, skills and training transfer, combined with knowledge retention models, provide a suitable groundwork for understanding adequate tacit knowledge transfer in the automotive industry or a highly technical environment. This study is focused on testing the effect that the management of scarce skills, succession planning, trainee characteristics, training design and work environment has on adequate technical skills and tacit knowledge transfer. This influence was tested using the following theoretical/conceptual hypothesised framework.

Figure 1.1: Proposed theoretical/conceptual framework of drivers/strategies of technical skills and knowledge transfer



1.4.1 Hypotheses

The hypotheses for the proposed hypothesised framework are listed below:

- I. H₁ – Management of scarce skills promotes technical skills and knowledge transfer.
- II. H₂ – Succession planning promotes technical skills and knowledge transfer.
- III. H₃ – Trainee characteristics promote technical skills and knowledge transfer.
- IV. H₄ – Training design promotes technical skills and knowledge transfer.
- V. H₅ – Work environment promotes technical skills and knowledge transfer.

1.5 PURPOSE / RATIONALE / CONTRIBUTION OF THE STUDY

There has been a lot of research in the field of training, skills and knowledge transfer, however the findings focus on age gap and an aging work force and are not specifically focused on technical skills or hard skills. Blume, Ford, Baldwin and Huang (2010)

suggest that future research must examine factors that prove valuable to the company's limited resources.

The limited resources as defined by this study is technical knowledge as held by the experienced workforce with high tacit knowledge. The focus is aimed at retaining people with critical knowledge in aging organisations to enhance continuity, innovation and competitiveness in their respective industries.

Facilitating knowledge transfer among employees is a fundamental theme of organisational learning and knowledge management research (Argote, McEvily & Reagans, 2003), however in many cases, economic motivation such as organisational rewards have failed to achieve this goal (Bock, Zmud, Kim & Lee, 2005). In social network research, strong ties between the knowledge source and the recipient have frequently been claimed to motivate knowledge transfer (Hansen, 1999).

This study aims to add knowledge about factors influencing critical technical knowledge and skills in the automotive industry and organisations with high technical tacit knowledge inherent in their experienced employees. The results could be used to enhance understanding and support critical knowledge transfer. Furthermore, the results could be used as a troubleshooting guide for possible loss or stagnation in company revenue caused by inadequate tacit knowledge transfer from retired employees.

1.6 RESEARCH QUESTIONS

The research questions for this study are provided as follows:

- i. Does the management of scarce skills positively influence technical skills and knowledge transfer?
- ii. Does succession planning positively influence technical skills and knowledge transfer?
- iii. Do trainee characteristics positively influence technical skills and knowledge transfer?
- iv. Does training design positively influence technical skills and knowledge transfer?

- v. Does work environment positively influence technical skills and knowledge transfer?

1.7 RESEARCH OBJECTIVES

The primary and secondary research objectives are discussed in this section. The secondary research objectives informed the data collection process in the study to identify the critical factors.

1.7.1 Primary research objective

The primary objective of this study was to identify factors influencing critical technical knowledge and skills transfer in an automotive manufacturing environment.

1.7.2 Secondary research objectives

To achieve the above-mentioned primary objective, the following secondary research objectives were pursued:

- Conduct a literature study on the variables identified.
- Design a structured questionnaire for the collection of primary empirical data.
- Distribute the questionnaire to employees in an automotive manufacturing plant.
- Capture the data using a computer software programme, Microsoft Excel.
- Analyse the data using a statistical analysis computer software programme, STATISTICA.
- Interpret the empirical results attained.
- Draw conclusions from interpretations.
- Provide recommendations based on the results of the study.

1.8 RESEARCH DESIGN AND PARADIGM

A quantitative approach, using the research tradition of positivism was followed in this study. The positivistic paradigm originated in the field of natural sciences and is rooted

in the philosophy of realism (Collis & Hussey, 2014). Positivism assumes that social reality is singular and objective, and it is not affected by the act of investigating it. Furthermore, positivism assumes that social phenomena can be measured. For this very reason it is associated with quantitative methods of analysis based on the statistical analysis of quantitative data (Collis & Hussy, 2014). The main objective of positivists is to prove hypotheses by using quantitative data, deductive reasoning and generalising of the sample to a population (Williamson & Johanson, 2017).

In this study, a closed-ended questionnaire was distributed among the research participants. Statistics were generated from their responses and this data was used to test relationships between the independent variables and the dependent variable. The independent variables were the drivers of technical skills and knowledge transfer, and the dependent variable was technical skills/knowledge transfer itself.

1.8.1 Research approach

A web-based mail survey, containing a close-ended questionnaire was used to measure the research variables of technical skills and knowledge transfer. A mail survey was selected as a data collection method, because it supports direct questioning of respondents in a large sample size. The survey was directed at technical employees with technical skills levels ranging from beginners to advanced expert level. Demographic questions were included in the questionnaires. All questions related to the research variables were presented in a Likert-type scale to collect empirical data supportive of the use of advanced statistical techniques, such as multiple regression analysis. The Likert Scale provided answer opinions ranging from (1) strongly disagree to (5) strongly agree.

1.8.2 Sampling design

Collis and Hussey (2014) define a population as a precisely defined group of persons or objects considered for statistical purposes. The population under consideration was approximately 300 technical employees, which included both newly appointed employees and soon to retire technical employees at an automotive manufacturing plant in Port Elizabeth, South Africa.

According to Collis and Hussey (2014), a sample is a sub-set of a population and a sample frame is a population record from which a sample can be drawn. Wegner (2016) defines a sample unit as the item being observed, counted or measured with respect to the random variables being examined. The sampling unit in this study, referred to technical employees who were employed at an automotive manufacturing site in Port Elizabeth, South Africa. A list of employees provided by the human resource department was used as the sampling frame from which the sampling unit was drawn.

Convenience sampling was used in this study. This method was the most appropriate for this study, since the technical employees from one manufacturing plant were surveyed within the automotive sector, allowing for cost-effective and simpler data collection. An example of convenience sampling is to survey a representative sample from one organisation, as opposed to several organisations within a particular industry. The method is generally selected because of close proximity to the researcher, thus lowering costs and allowing for easier data collecting (Babbie & Mouton, 2015).

1.8.3 Data collection instrument and administration

Both primary and secondary data were used in this study. Primary data was collected from respondents, while secondary data consisted of a literature review. With reference to quantitative analysis, primary data was collected using a close-ended questionnaire. Every questionnaire item or question was coded using STATISTICA and then interpreted. Any spoiled or incomplete questionnaires were disposed and excluded from the study analysis and results.

1.8.4 Research ethics protocol

According to Collis and Hussey (2014), the term ethics refers to the principles or moral values which form the basis of conduct. They define research ethics as a term that refers to the manner in which research is conducted and the way in which the results and deductions are reported.

The research ethics protocol and principles of the Nelson Mandela University were maintained in the study, with ethics reference number H20-BES-BUS-057. A comprehensive cover letter that detailed informed consent, confidentiality, privacy and anonymity was attached to the survey/questionnaire. A letter of consent was signed by the Plant Manager and Human Resource Manager of the automotive company under consideration, allowing their employees to participate in the study, on condition that the dignity and anonymity of the respondents would be protected. To protect the well-being and anonymity of the respondents, only average scores per item were reported in this study. The research treatise was submitted to Turn-It-In, which is a software programme used to detect and measure the degree of plagiarism.

1.8.5 Data analysis

STATISTICA, a data analysis computer software programme was used to analyse the collected sample data. Babbie and Mouton (2015) indicate that statistical analysis is congruent with quantitative paradigm. They further state that quantitative research involves the collection of numerical data and generalises the data across groups of people or it is used to describe a phenomenon.

1.8.6 Descriptive statistics

Descriptive statistics were used to describe basic information about the variables tested by identifying the location, spread and shape of the data. The common measures of location are means, modes, medians, while standard deviation and ranges are often used to describe the spread and shape of the data, including dispersion (Wegner, 2016). Furthermore, dispersion is a critical measure that indicates the variability of data that affects reliability. Descriptive statistics were applied to each questionnaire item.

1.8.7 Inferential statistics

In this study, inferential statistics were applied using hypothesis testing. According to Babbie (2016), hypothesis testing states and makes predictions about the relationship between two or more variables and must therefore be testable and unambiguous.

Pearson correlation, multiple regression analysis and multi-collinearity tests were applied and the results were interpreted.

In this study, the Pearson correlation was used to test the relationship between each independent variable and dependent variable, and among the independent variables. Hair, Celsi, Money, Samouel and Page (2015) write that Pearson correlation measures the linear relationship between two metric variables and the number demonstrating the Pearson correlation is known as a correlation coefficient, meaning that the greater the coefficient, the higher the covariation and the stronger the relationship.

Hair et al. (2015) indicate that in multiple regression analysis, numerous independent variables are added to the same type of regression analysis equation to determine a single dependent variable. Furthermore, a respective coefficient is determined for each independent variable, which describes its unique correlation with a dependent variable. According to Wegner (2016), multiple regression analysis aims to define the set of independent variables that will be significantly related to the dependent variable, for it to be used to predict values of the dependent variable through a multiple linear regression equation. Hair et al. (2015) state that multiple regression is a more realistic prediction, because natural occurrences usually rely on more than one factor. Multiple regression was used to understand the relationship between drivers of technical skills and knowledge transfer, and its impact on technical skills and knowledge transfer.

1.8.8 Reliability test

Hair et al. (2015) define reliability as the extent to which the item scale is free of random unstable error, thus the degree of dependability, consistency and stability present in its measurement result.

For the purpose of this study, Cronbach's Alpha was used as the reality test. One of the three forms of internal consistency reliability is the coefficient alpha, also known as Cronbach's Alpha, which is obtained by determining the mean of the coefficients from all possible combinations of split halves (Hair et al., 2015). A Cronbach's Alpha of 0.6 is considered as fair, while a value of 0.7 and above is considered as good (Zikmund, Babin, Carr & Griffin, 2013).

1.8.9 Validity test

Validity is defined as the degree to which a test measures what it is supposed to measure (Cooper & Schindler, 2011). The questionnaire was developed based on the main learning points of the literature study, specifically the factors identified that influence the transfer of learning skills. The questionnaire was also discussed with the supervisor who is experienced in the field of research and human resource management.

1.9 REPORTING OR SYNTHESIS

The results of this study were synthesised with interpretations, conclusions and recommendations informed by the statistical results. The demographics of the sample, which included all technical employees at an automotive plant, were portrayed graphically and interpreted. As informed by the questionnaire, the demographic analysis provided information on gender, age-group, education-level, occupation-level and employee tenure.

The measuring instrument provided stable and consistent results and was presented using Cronbach's Alpha, which is a form of reliability. Pearson correlations were used to determine the relationship between the independent variables and dependent variable. Multiple regression analysis results were discussed and interpreted to answer the primary research question.

A conclusion providing answers to the research questions is provided, including the limitations of the study discussed. Future study recommendations were suggested.

1.10 TREATISE STRUCTURE

The structure of the treatise is summarised below.

1.10.1 Chapter 1

The aim of chapter 1 was to outline the scope of the study. The problem statement was stated and main concepts were included. The methodology which underlined the selected theories of application, being positivistic and quantitative paradigms was introduced. The research, sampling design, data collection methodology, ethical concerns, data analysis, reporting methods and results synthesis were presented.

1.10.2 Chapter 2

Chapter 2 presents a theoretical overview. The objective of chapter 2 is to understand the relationship between technical skills and knowledge transfer and its drivers through an extensive literature review.

1.10.3 Chapter 3

Chapter 3 presents the theoretical underpinnings behind research paradigms, methodological paradigms and their approaches. Concepts discussed include sampling design, data collection methods, ethical issues, data analysis methods and the method of reporting and synthesising results used in this study.

1.10.4 Chapter 4

Chapter 4 presents the empirical data collected in the study and its analysis using demographics, descriptive and inferential statistics.

1.10.5 Chapter 5

Chapter 5 provides a summary of the study, a discussion of the main findings, recommendations and areas for future research.

CHAPTER 2

LITERATURE REVIEW

Technical Skills and Knowledge Transfer for an Aging Workforce in the Automotive Industry

2.1 INTRODUCTION

Chapter 1 provided the background to the study. The aim of this study was to investigate factors influencing technical knowledge and skills transfer in an automotive environment.

Tacit knowledge transfer is crucial for developing competitiveness against rivals, business continuity and resistance in any organisation. However, the execution and sustainability of tacit and technical knowledge transfer are key in ensuring that this knowledge is not lost, but successfully retained within the organisation.

Organisations face a dilemma when incumbent tacit knowledge owners vacate employment without transferring invaluable intellectual property to other stakeholders (Khumalo, 2012). Singh and Premarajan (2007) postulate that when an employee leaves an organisation, all the knowledge that the employee acquired also leaves the organisation. Once this knowledge is lost, it may be impossible to recover and difficult to hide from competitors (De Long & Storey, 2004). Failure to curb the leakage of organisational knowledge can inhibit competitive advantage and stifle organisational agility (De Long & Storey, 2004). If not corrected, lost knowledge can also limit marketing efforts and lower profit margins. The origin of intellectual property leakage can also be traced to a lack of knowledge management strategies and poor succession planning (Rothwell, 2005). The concept of intellectual property leakage was introduced by Baughn, Stevens, Denekamp, and Osborn (1997).

Dawes, Cresswell and Pardo (2009) suggest that alleviating the lack of knowledge sharing in organisations by channelling knowledge transfer within what they call “public sector knowledge networks” (PSKNs) and lament that failure to do so can stifle and delimit organisational growth. Implementing knowledge transfer processes in

organisations can keep intellectual property in-house, boost marketing efforts and lead to organisational stability (Rothwell, 2005).

The objective of chapter 2 is to investigate knowledge transfer and its drivers, by reviewing existing literature. In this study, technical skills and knowledge transfer, its antecedents, outcomes, measurement and knowledge retention are of importance. The notion of knowledge transfer will be explored throughout this research and a conceptual model is derived to illustrate the drivers of knowledge transfer.

2.2 DEFINITION OF KNOWLEDGE TRANSFER

This section focuses on knowledge transfer which is the dependent variable in this study. Singh and Premarajan (2007) term knowledge transfer as a method which is used by an organisation to recreate existing knowledge in a new setting. They further define knowledge as a method by which incumbent managers or experienced employees share their skills with their subordinates or other employees to create successful future leaders, when applied to leadership.

2.2.1 Explicit knowledge

According to Coakes (2004), explicit knowledge is unambiguous information that can easily be documented and arranged, such as being compiled into training manuals and archived. Unlike tacit knowledge, explicit knowledge can be shared easily.

2.2.2 Tacit knowledge

Tacit knowledge is defined as what an individual knows from experience or from cognition, hence it is implicit and ambiguous. An individual uses this acquired knowledge to perform a task or a set of tasks. Polanyi (1966) contends that tacit knowledge owners do not involuntarily share what they know with others, because tacit knowledge is locked in the mind and emotions of people. Polanyi (1966) is of the opinion that tacit knowledge is not written but spoken and is concealed in people's brains. Furthermore, tacit knowledge is experience that is grounded by people's feelings, skills, intuitions, perception, observations, and is acquired information. Irick

(2007) maintains that tacit knowledge is recognised as the foundation of organisations to again competitive advantage over their rivals, hence it is invaluable to any successful organisation.

Coakes (2004) adds to the work of Polanyi (1966) and stresses that tacit knowledge represents intellectual capital that incumbent leaders have acquired from their daily work experiences. The loss of tacit knowledge occurs in organisations that do not have mechanisms to capture and retain tacit knowledge in-house (De Long & Storey, 2004; Nonaka, Toyama & Nagata, 2000). De Long and Storey (2004) postulate that unless tacit knowledge is captured and preserved for future use, it can be lost and hard to recover. Stevens (2010) suggests establishing a common database as a central resource to store all tacit knowledge. Korn (2007) contends that the problem of lost knowledge requires the collaboration of corporate leaders and a robust strategy for succession planning.

The lack of a knowledge supervisory system can result in lost intellectual property and organisational demise (De Long & Storey, 2004). The main drawback to organisations that do not have viable knowledge transfer programs in place, can also be evidenced by a leadership knowledge gap. For knowledge transfer to be effective, it must occur concurrently with the tenure of incumbent knowledge owners (Rothwell, 2005). Watson and Hewett (2006) indicate that tacit knowledge has become a vital factor to an organisation's competitive advantage and with the lack of it, organisations will not be able to surpass their competitors.

2.2.3 Ambiguous knowledge

Ambiguous knowledge is known as the part of tacit knowledge that can be understood in many ways. This knowledge is difficult to be documented and is shared through story telling. Ambiguous knowledge is learned through experience but does not require long years of experience. This form of knowledge cannot be acquired through a knowledgeable mentor, expert or teacher. It could simply be passed on through the sharing of an opinion or observations by an individual who has gone through an activity or an experience. This type of knowledge resides in an individual's enormous mental store of experience (Singh & Premarajan, 2007).

2.2.4 Knowledge transfer

Singley and Anderson (1989) document that knowledge transfer takes place when existing information, skills and knowledge influence the way in which new skills and knowledge are demonstrated, consumed and performed. Furthermore, at an individual level, knowledge transfer is the way knowledge is attained in a particular environment and used or cannot be used in another environment. Hackley (1999) indicates that knowledge transfer is positive, when attainment or execution of new knowledge and skills are expediated. Furthermore, knowledge transfer is negative when attainment or execution is hindered.

Three determinates of the transfer process are education, communication and motivational elements (Ko, Kirsch & King, 2005). The ability to retain knowledge, demonstrate understanding and maintain challenging and complex relations, is known as the educational or learning element. Communication elements associated with source credibility include the source to encrypt and the vessel to decrypt. Motivational elements are related to motivational characteristic of the source and the vessel (Ko et al., 2005).

2.2.5 Organisational knowledge transfer

Organisational knowledge transfer is a process by which organisations, its actors (teams, units or organisation) provide, receive and are affected by knowledge and experience of other. Subsequently for organisational knowledge transfer to be effective, it must be integrated with different knowledge, since it is demonstrated when it transforms in the knowledge sources or performance of trainees (Argote, Ingram, Levine & Moreland, 2000).

Circumstantial conditions may affect the knowledge transfer relationship with its antecedents. Inkpen and Tsang (2005) find that is more difficult to transfer knowledge within different units of the same organisation, as opposed to transferring knowledge across various organisations (Inkpen & Tsang, 2005).

2.3 ANTECEDENTS AND OUTCOMES OF KNOWLEDGE TRANSFER

In this section, the antecedents of organisational knowledge transfer and the antecedents of knowledge transfer are discussed. The antecedents of organisational knowledge transfer are knowledge, organisational and network characteristics, while the antecedents of knowledge transfer are culture and trust.

2.3.1 Antecedents of organisational knowledge transfer

Knowledge transfer is a process that is used by organisations to reconstruct and preserve complicated and ambiguous forms of procedures and routines in a new setting (Argote et al., 2000). According to Adler and Kwon (2002) and Inkpen and Tsang (2005), there are three categories of antecedents of organisational knowledge transfer: (i) knowledge, (ii) organisational, and (ii) network characteristics.

Several empirical studies found ambiguity to be the most significant determinant of organisational knowledge transfer (Levin & Cross, 2004; Szulanski, Cappetta & Jensen, 2004; Simonin, 1999). Coff, Coff and Eastvold (2006) stress that knowledge ambiguity promotes knowledge protection by ensuring knowledge is not replicated by competitors. They further suggest that knowledge ambiguity has a negative effect on organisational knowledge transfer.

Organisational characteristics are very broad and their function, size and age, including absorption capacity and decentralisation have been assessed in numerous studies. The role of size as a control variable shows a positive influence on knowledge transfer (Laursen & Salter, 2006; Dhanaraj, Lyles, Steensma & Tihanyi, 2004; Gupta & Govindarajan, 2000). However, in a study by Tsang (2002), the role of size was found to be non-significant and in other studies by Makino and Delios (1996), organisational size showed negative influence on the degree of knowledge transfer which appears to be mixed (Van Wijk, Jansen & Lyles, 2008).

Previous studies considered age and units of the organisations as significant predictors of knowledge transfer. Furthermore, the notion exists that aging organisations have become passive with restricted proficiency to learn and adopt a

continual, evolving environment (Pedersen, Petersen & Sharma, 2003). According to Frost, Birkinshaw & Ensign (2002), relational patterns and cognitive dimensions of younger organisations are supposed to be modified effortlessly. They argue that knowledge transfer in younger organisations usually yields more positive learning benefits compared to that in older organisations. However, other research suggests that there is no effect regarding age with knowledge transfer (Gray & Meister, 2004; Yli-Renko, Autio & Sapienza, 2001). This indicates that previous empirical research has been inconclusive about the influence of age on organisational knowledge transfer.

In network characteristics, social relations display a crucial function in enabling resources to interchange knowledge (Adler & Kwon, 2002). Structural, relational and cognitive dimensions are the three main dimensions where it is possible to evaluate and separate social context (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998). Reagans and McEvily (2003) postulate that access to suitable knowledge transfer is facilitated by relations. Social relations that influence knowledge transfer are cultural distance, systems and shared vision (Inkpen & Tsang, 2005). Systems and shared vision encourage mutual understanding and offer an important binding agent that enables knowledge to be integrated by various actors.

2.3.2 Outcomes of organisational knowledge transfer

External and internal sources on organisational knowledge transfer show a significant influence on organisational innovation and performance (Van Wijk et al., 2008). Other studies suggest organisational knowledge transfer and performance are positively related or correlated (Steensma & Lyles, 2000; Lyles & Salk, 1996). Szulanski (1996) maintains that value is added by knowledge transfer to the enhancement of organisational competences that are challenging to emulate and further lead to improved performance. Subsequent empirical studies suggest that innovation is at the core of knowledge transfer. It is evident that new creative ideas can be generated in organisations that embody knowledge transfer disciplines and appreciate new and existing knowledge (Jansen, Van Den Bosch & Volberda, 2005; Tsai, 2001; Powell, Koput & Smith-Doerr, 1996).

2.3.3 Antecedents of knowledge transfer

Singley and Anderson (1989) state that knowledge transfer occurs with existing skills and influences how newly acquired skills and knowledge are attained and executed. They further add that at an individual level, it is how acquired knowledge in a particular setting applies or fails to apply in other situations.

Organisational culture entails beliefs and knowledge shared among employees in an organisation (Nonaka & Takeuchi, 1995). According to the research of Duhon (1998), accessing tacit knowledge is more about managing the internal culture of an organisation than it is about implementing technology. The author refers to the dark side of knowledge as power and maintains that people generally refuse to share or transfer their knowledge because of fear, confusion and sometimes stubbornness Duhon (1998).

In the empirical research conducted by Orlikowski (1992), collaboration did not exist in individualistic and competitive organisational cultures with few incentives or customs for cooperating or sharing knowledge. For an effective knowledge transfer, sharing is important and without the adaptation of knowledge, the transferring of knowledge is incomplete. An 'adaptation culture' can be defined as an organisational culture that encourages knowledge adaptation by offering motivation or support to utilise the attained knowledge (Singh & Premarajan, 2007).

Karlsen and Gottschalk (2004) contend that culture has a crucial function in knowledge transfer. In their study, they found that project success in technological and IT companies related to culture led to effective knowledge transfer. Culture stimulates behaviour for knowledge formation and distribution and is utilised in various forms (De Long & Fahey, 2000). Culture can be an enabler for knowledge transfer (Singh & Premarajan, 2007).

Allison (2000) postulates that knowledge hoarding inefficiencies can be avoided in organisations when management creates an environment of trust and where people feel secure enough to share their knowledge and experiences. To share and adapt knowledge requires trust for knowledge transfer to take place. 'Sharing

trustworthiness' can be defined as trustworthiness of the mentor or transferee and the trustworthiness of the organisation. In simple terms, the trust that the transferor has in the transferee for no misuse of the knowledge or that the sharing of knowledge would not reduce an individual's value to the organisation (Singh & Premarajan, 2007). The trust which employees have in the mentors or knowledge transferor, while using the information to create or enhance their knowledge can be defined as 'adaptation trustworthiness' (Singh & Premarajan, 2007).

Lewis and Weigert (1985) document that trust is a social process related to the perceptions held by one party of another party's abilities, expertise, knowledge, motives or intentions. The general expectation for trust to exist is that one party will make unswerving promises and fulfil its commitments. A consequence of regular and steady exertion tirelessly over time is known as trust (Blois, 1999). Trust plays a major role in determining the adaptation, transference and sharing of knowledge (Singh & Premarajan, 2007).

2.3.4 Recent studies on trust and culture as an enabler of knowledge transfer

Based on the literature, it is evident that culture demonstrates a significant function with the transference of knowledge (Karlsen & Gottschalk, 2004). De Long and Fahey (2000) contend that it influences behaviour and creation, sharing and transfer of knowledge in many ways. Culture is an enabler of knowledge transfer. Jones, Cline and Ryan (2006) indicate that transferring knowledge requires the willingness of both parties involved to cooperate to share knowledge for their mutual benefit. Knowledge transfer will not occur or may cease to exist if the employees of an organisation do not display high levels of cooperative behaviours. Furthermore, should the individual lack a natural inclination to share and collaborate with others, transferring of knowledge will be immensely difficult.

Transparency in decision-making and the sharing of information is essential for the organisation to enable a knowledge-sharing culture. In addition, fair treatment and reward of employees will contribute towards knowledge sharing success (Goh, 2002).

Blois (1999) found that trust influences behaviour and when the transferor of knowledge trusts the recipient, then it is more likely that the transferor will share their knowledge. Similarly, if the recipient trusts the transferor's ability, expertise, motives, intentions and knowledge, then the recipient will use and adapt the knowledge being shared. Trust has a positive influence on knowledge sharing and adaptation between both parties (Singh & Premarajan, 2007).

2.3.5 Outcomes of knowledge transfer

Boone and Ganesham (2007) postulate that organisations will experience reduced production levels and turnover costs if a knowledge transfer strategy does not exist. Although Boone and Ganesham (2007) introduced the notion of knowledge transfer using technology, the framework is still new and the guidelines are still developing.

De Long (2004) is of the opinion that the loss of intellectual capital to competitors can be alleviated by implementing knowledge transfer strategies. The author further stresses that a knowledge gap is created that affects the agility of an organisation when the intellectual capital is lost (De Long, 2004). Rothwell (2011) emphasizes that when new employees join the workforce, the knowledge gap can continue to exponentially widen unless organisations seize and hoard their tacit knowledge for future use in database memory systems. When knowledge is not stored or transferred, organisations will struggle to develop new product innovations and become less competitive against their rivals (Dychtwald, Erickson & Morison, 2006).

“Outcomes from companies that have adopted tacit knowledge transfer models provide protocols that can be emulated regardless of the lines of business or organisational types” (Näslund & Karlsson, 2004). Companies like IBM implement knowledge transfer capabilities to enhance their intellectual property license agreements, which have resulted in sales increasing by \$39 billion over a period of five years (Earl, 2001).

2.4 KNOWLEDGE RETENTION

Retaining knowledge in most technological companies is regarded as a key knowledge management struggle. Organisations experience this challenge because knowledge employees with tacit knowledge will exit the organisation and this could have a severe impact on the learning and memory capacity in an organisational. Management must ensure this knowledge type is accessible to every employee (Gaghman, 2019). Du Plessis (2006) document three main benefits of retaining knowledge within the organisation which are: to rapidly accelerate the development of new and young employees with the organisation; decrease the time to process and interpret new knowledge; and to warrant decision making as accurate and efficient.

2.4.1 Knowledge retention

Implementing knowledge management techniques which include capturing, transferring and retaining, is necessary and required in every organisation. Knowledge retention is about storing knowledge and enabling organisations to endure against their rivals over time (Argot, 2012). Nonaka (2008) postulates that knowledge retention is the method by which people mutually exchange their explicit and tacit knowledge.

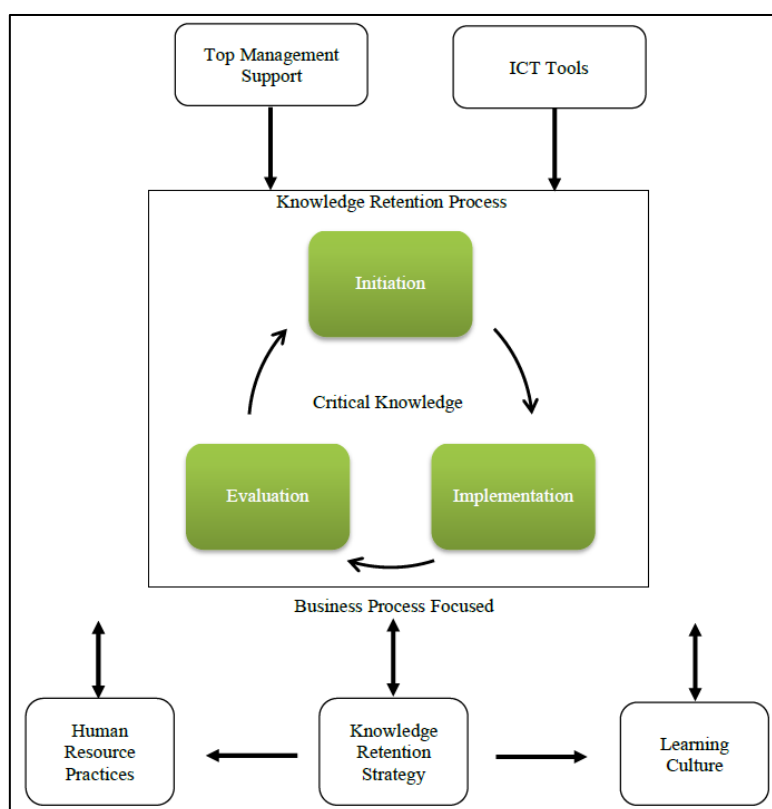
The implementation period for knowledge retention strategies differs in daily work. In the short term it is reactive, in the medium term it is about containment and in the long term it is preventative (Liebowitz, 2008). Knowledge can be captured by conducting exit interviews and handovers with employees if the successor is readily available. However, this strategy is very reactive and evidence indicates that it is not effective (Liebowitz, 2008). Lately, many organisations have tried to fill the knowledge gap experienced when employees leave the organisation without an adequate knowledge transfer, by recruiting retired employees as consultants. This exercise is highly costly for the organisation and does not necessarily guarantee knowledge transfer and retention. (Levy, 2011; Liebowitz, 2008). Levy (2011) indicates that a medium-term knowledge retention strategy such as a contingency plan can be implemented. This is when a retiree's knowledge is transferred at least three years prior to retirement. The author further documents another preventative method, which usually allows knowledge transfer to begin three months after new employees are recruited and

continues until they leave the organisation. The preventative method is considered to be highly effective and the best method, as it requires organisations to integrate knowledge retention within their human resource management (Liebowitz, 2008).

Riddell (2011) emphasises the importance of an organisation developing a strategy for addressing the negative impact of knowledge loss when employees exit the organisation. This can be done by setting clear and relevant objectives, which address the needs of individuals and groups, through adequate knowledge retention strategies. De Long (2004) suggests that knowledge retention should be implemented in the system of the organisation by evaluation four key perspectives: the human resource and strategic, the functional subject matter and the management of knowledge view.

The knowledge retention model suggested by Doan, Grundstein and Rosenthal-Sabroux (2011) examines the main influences for knowledge retention in an organisation. Their model includes five main factors significant for knowledge retention, as shown in Figure 2.1.

Figure 2.1: The Model of Knowledge Retention



Source: Doan et al. (2011)

Morrissey and Schoemaker (2005) indicate that when knowledge sharing is effective, it may be a result of attaining a shared objective to enhance social and professional relationships in the company. Additionally, when an organisation understands these dimensions, it will mitigate the threats of losing knowledge retention. Important questions for any organisation to ask are: what kind of knowledge and whose knowledge possibly will pose a substantial influence on the functioning or performance of the organisation (Martins, 2010)? It is evident that many managers and strategists understand the impact of losing knowledge, hence they attempt to preserve knowledge by retaining experienced workers for longer periods in their organisations, but this is a challenging and critical issue for them. Adequate understanding of the employees' individual behavioural factors which affect the retention of tacit knowledge in the organisation is crucial for knowledge retention. Organisations are encouraged to focus on knowledge retention as part of the knowledge management strategy which will improve the organisation's overall performance (Gaghman, 2019).

Nonaka (2002) maintains that an employee's knowledge relies on everyone's input within the organisation. Blackler (2002) claims that those employees who regularly share their knowledge represent a crucial role in the organisation's competitiveness and competence. He further reveals that efficient strategies for creating knowledge retirement, evaluation of roles and identification of key experienced workers, may all help organisations develop profiles of employees to prevent knowledge loss.

2.5 SUCCESSION PLANNING

2.5.1 General overview of succession planning

There are various definitions of succession planning. Trepanier and Crenshaw (2013) refer to succession planning as a vital business strategy that endorses effective transition and continuity of leaders within an organisation, while maintaining productivity. In this study, succession planning is defined as a formal and precise exertion by an organisation to ensure organisational and leadership continuity in essential positions. This type of effort is focused on retaining and developing intellectual and capital knowledge for the future of the organisation, aimed at motivating leaders to improve performance (Rothwell, 2011).

Rothwell (2011) postulates that succession planning is traditionally highly confidential, which enables it to be lopsided in many companies. This traditional approach generally leads to leaders favouring individuals or groups known personally to them or only close friends and this lacks merit and equity due to the 'godfather influence'. The consequent attitude of employees who are not nominated or given an opportunity due to traditional succession planning methods, lead to them having no interest, high resentment and less obligation to do minimal tasks or they lack effort aimed at knowledge transference and sharing (Rothwell, 2011). Simoneaux and Stroud (2014) encourage organisations to adopt a strategic approach which will prepare employees and managers for business continuity, focused on unavoidable replacement of key employees, because success planning is a critical initiative for strategy execution. Sabir and Kalyar (2013) stress that developing policies that encourage learning through improved business practices such as knowledge transfer and succession planning could close the knowledge gap and further increase organisation competitiveness, lower employee tenure and increase job satisfaction.

According to Rothwell (2011), the retirement of the workforce and the shortage of technically experienced employees present substantial challenges to senior leaders, should they decide not to take immediate counter-measures to prepare for the upcoming generation of employees and leaders. Several empirical studies have explored the problems of talent management and succession planning, however organisational leaders have failed to focus on developing a durable pool of talented individual at junior or lower levels. Loss of experienced, skilled and talented employees in an organisation, is one of the ruthless eventualities experienced by organisations challenged to sustain their employees and competitiveness against their rivals (Pandey & Sharma, 2014).

2.5.2 Coaching and mentoring

Okechukwu and Raymond (2015) analysed coaching and mentoring as an education association which enhances employee expertise and improves their capability for improved job performance. They found that personal skills of employees are improved by coaching and mentoring, with effective education methods that surpass conventional training methods, thus enhancing competitiveness.

Various positive organisational outcomes are experienced by workers with active mentors, which includes improved job performance, personal learning, better job satisfaction, employee dedication and decreased employee turnover. Furthermore, integrating development leadership and succession planning through coaching and mentorship will assist in increasing the placement of talented leaders and their ideal development. The psycho-social benefits of transfer, including acknowledgment, reassurance, teaching and job facilitation are improved because of successful mentoring relationships (Ibidunn, Osibanjo, Adeniji, Salau & Falola, 2015).

Tarus (2014) defines mentoring learning and knowledge sharing as collaboration between workers aiming to share technical and organisational knowledge and skills. This offers a chance for acquiring an understanding of a particular profession, occupation, job, organisation and other endeavours. Correspondingly, Jakubik, Eliades, Weese and Huth (2016) refer to mentoring as a process whereby a trusted, and knowledgeable teacher guides their mentee over a long period of time. In addition, it is a development-driven, relationship-oriented mentoring relationship. In the context of knowledge transfer, Brondyk and Searby (2013) document that mentoring occurs over a period of time with knowledge exchange, expertise and social collaboration while transferring knowledge. They further argue that the key mentoring objective is to develop selected individuals, impart knowledge, give feedback and share knowledge to develop self-reliant employees to fill leadership gaps.

Mentoring benefits both parties involved by enhancing confidence and trust, improving performance and facilitating the transfer of additional skills and knowledge, which enhance collaboration amongst professionals. Furthermore, for mentorship to be successful, shared trust, mutual interest, shared morals and obligation to both organisational and personal objectives must exist.

Crumpton (2014) documents four main benefits for a mentoring course and notes the following main items:

1. Improved technical skills for the mentor who, through the process increases their technical ability.
2. Improved technical skills of the mentee who becomes more efficient in the execution of their new job and ultimately prepares for the next job position.

3. Acquiring new technological experience by the mentee has a positive effect on retention and turnover intention.
4. Effective succession planning activities help to develop and sustain institutional knowledge. Thus, the leadership pipeline is maintained and assured.

Tarus (2014) added to the work of Crumpton (2014) and emphasizes benefits of mentorship as an intentional, systematic sharing and transfer of knowledge, aimed at providing work specific knowledge with an attempt to achieve present and future strategic goals of an organisation. The author further indicates that the outcomes of good mentorship are improved morale, reduced employee turnover, rapid employee development and assistance in developing solutions to organisational challenges.

Mentorship has been proven to assist apprentices to develop their professional careers by supportive educational and practical skills to enhance their abilities and skills. Some research has revealed that mentoring is fundamental in fast-tracking employee development, enhancing talent, improving employee retention and creating a high-performance work culture, and as a result mentoring has developed sustainable succession planning (Tarus, 2014). Wheeler and Cooper (2016) write that a mentorship approach facilitates succession planning, employment satisfaction, employee retention and professional growth. They further support the notion that mentorship improves trust and confidence in one's position, increases productivity and facilitates the transfer of new skills and knowledge.

Khakwani, Aslam, Azhar and Mateen (2012) write that coaching and mentoring enhance the performance of workers through the influence of new skills and knowledge amongst workers. Mentoring can be used as a tool to develop and enhance the skills of trainees. Furthermore, there is a strong relationship between skill development and knowledge sharing, which enhance aptitude level and learning (Bello & Mansor, 2013).

In every knowledge organisation, the main vehicle of technical knowledge transfer is coaching, more especially in highly technical organisations. Training transfer from theory to practice, is facilitated through coaching (Ogunyomi, 2013). Rothwell, Jackson, Ressler, Jones and Brower (2015) indicate that coaching is an effective

method of promoting efficiency. For this reason, coaching may assist in reducing costs associated with recruitment and retaining employees.

According to Van Genderen (2014), the advantages of coaching include improved behavioural modification, enhanced reasoning capability and independent education. Furthermore, in most organisations coaching is utilised to enhance the performance of a team, group or individual (Grover & Furnham, 2016).

2.5.3 Succession planning benefits

The main benefit of effective succession planning implementation is knowledge retention (Ejapomewhe, 2017). The three key reasons why employees exit an organisation, identified by Aladwan, Bhanugopan and Fish (2013), are job prospects, individual desires and individual obligations. Therefore, it is crucial for organisations to retain their highly skilled employees by successfully implementing succession planning, while maintaining a competitive advantage.

According to Bansal (2014), the key objective of retention is to prevent organisations from losing their most competent employees and losing institutional knowledge, which affects service delivery and productivity. When organisations retain competent employees and develop a system for storing tacit knowledge, knowledge loss may be prevented. Memory of an organisation is not restricted to gathering and stringing knowledge, but in promoting knowledge transfer (Esmaeli & Saedabadi, 2016).

2.5.4 Succession planning and tacit knowledge transfer

A launching pad for advanced succession planning has to do with the transfer of tacit knowledge. When leaders practice knowledge transfer behaviours, they improve bench strength. Bench strength is the ability to promote employees from within the organisation instead of recruiting from outside (Rothwell, 2005). The leadership knowledge gap between older, experienced leaders and younger, new leaders can be bridged by implementing the process of knowledge transfer. Ultimately, an organisation should develop a pool of talented employees for both horizontal and vertical employee advancement (Rothwell et al., 2015).

2.6 TRAINING TRANSFER

Training transfer and its factors are discussed in this section. In addition, the three independent variables of trainee characteristics, training design and work environment will also be discussed in this section.

2.6.1 Training transfer factors

Training transfer is referred to as the extent to how people successfully use skills, expertise, manners and behaviours attained during training of a particular task (Holton, 1996). In organisations, training consists of conceptual understanding, mainly for employees by employers, intended to develop fresh knowledge and skills that are required to be applied instantly upon arrival or return to work (Broad & Newstrom, 1992).

Ford and Weissbein (1997) document that training transfer relies on interactions between the work environment and trainee characteristics. In the empirical literature of Baldwin and Ford (1988), three sets of factors prompting training transfer are identified as inputs of training, training outputs and transfer settings. Training input includes design of training and outputs of training consist of knowledge and preservation, while conditions of transfer entail generalisation and maintenance of training.

2.6.2 Trainee characteristics

Burke and Hutchins (2007) are of the opinion that trainee characteristics play a significant part in the transfer of training. Training characteristics focus on cognitive ability, self-efficacy, motivation and perceived utility of training, which are discussed below.

According to Burke and Hutchins (2007), the cognitive ability of trainees is a very powerful determinate of transfer results as the performance of a trainee is influenced by cognitive ability. High cognitive ability employees are more equipped to retain and process knowledge attained at training (Kanfer & Ackerman, 1989). Blume et al.

(2010) indicate that cognitive ability is significant for training transfer. Furthermore, trainees with a greater cognitive ability stand a better chance of acquiring, utilising and maintaining trained skills successfully. Therefore, organisations may safely make the deduction that the cognitive ability of trainees will play a pivotal role and ultimately result in training transfer success.

Self-efficacy refers to the judgement an employee forms about their ability to execute a required job (Bandura, 1982). According to Robbins and Judge (2009), the higher the self-efficacy of an individual, the more confident they will be to successfully attain targeted skills and perform trained tasks. Furthermore, in more challenging situations, employees with low self-efficacy are more likely to discontinue or reduce their effort, whereas those with high efficacy are more likely to apply more effort to overcome the challenge. Burke and Hutchins (2007) maintain that self-efficacy has consistently shown positive relationships with the transfer of training. The study of Velada, Caetano, Michel, Lyons and Kavanagh (2007) found that performance self-efficacy is significantly related to training transfer.

Motivation is defined as the process or drive affecting a trainee's direction, intensity and persistence of effort directed towards achieving a goal (Robbins & Judge, 2009). Fecteau, Dobbins, Russell, Ladd and Kudisch (1995) reveal that for transfer to take place, employees must believe that they have the ability to learn, their effort to learn will improve their performance and an improvement in their performance will result in valued outcomes. Naquin and Holton (2002) researched motivation related to improving work through learning (MTIWL) that incorporates motivation to learn and motivation to transfer. Tziner, Fisher, Senior and Weisberg (2007) discovered that motivation to learn is a stronger contributor to training outcomes. Lim and Johnson (2002) explored other factors believed to enable or hinder transfer and found a primary supporting variable of motivation to transfer. Grossman and Salas (2011) indicate that it is important for employees to remain motivated throughout the various phases of their training and development process to enable transfer to occur. Furthermore, employees must believe that it increases their performance through learning, and that such improvements ought to benefit them.

Chiaburu and Lindsay (2008) postulate that is highly effective when trainees notice a clear connection between required performance and the outcome they value. Burke and Hutchins (2007) identified four factors influencing the perception of training utility. These include employees' belief that applying new learning will improve their performance, employees' recognition of a need to improve their performance, employees' assessment of the credibility that the new skills will improve their performance and employees' perception that new skills will ease knowledge transfer. It is widely known that employees who perceive training as valuable and useful, are far more likely to apply new competencies to the job than those who do not. Employees not confident about the importance of training will lack the motivation to learn and to apply targeted competencies and skills (Grossman & Salas, 2011).

2.6.3 Training design

Grossman and Salas (2011) found that behavioural modelling, error management and realistic training environments have solid relationships with the transfer of learning. Furthermore, they emphasize that design and delivery of training programs strongly affect learning and eventually transfer outcomes.

Grossman and Salas (2011) indicate that behavioural modelling is an effective training strategy as it integrates various learning principles. In addition, behavioural modelling is an effective strategy for endorsing the transfer of learning and training by offering opportunities for employees to perceive and exercise targeted behaviours, which promote their ability to learn and retain new knowledge and information. Taylor, Russ-Eft and Chan (2005) document that behavioural modelling enables negative and positive transfer models when employees formulate their own scenarios during training, they are encouraged to set goals, their supervisors are involved in the same training, and rewards and sanctions are introduced into the workplace. Based on literature, it is evident that behavioural modelling is significant for transfer of training.

Grossman and Salas (2011) claim that allowing employees to make errors and develop error management instructions have become effective in promoting an appropriate use of targeted skills and knowledge transfer in the work environment. According to Burke and Hutchins (2007), error-based training enables employees to

envision what may go wrong and prepares them with the necessary skills and knowledge on how to tackle potential challenges and problems. Heimbeck, Frese, Sonnentag and Keith (2003) found that training transfer was superior for employees who were offered error training and error management instructions as compared to employees who were prevented from making errors during training.

Most features of training should mirror the work environment as much as possible, in which the training competencies will be applied. Most organisations facilitate on-the-job training, that usually takes place in the actual physical and social environment where the tasks and activities will be performed (Salas et al., 2006). Burke and Hutchins (2007) are of the opinion that facilitating training in the setting and environment that resembles the workplace, will enable effective skills and transfer of training. Realistic training environments are therefore substantial contributors to the transfer of training.

2.6.4 Work environment

The effectiveness of training is greatly dependent on the ability of employees to practice their newly acquired skills and competencies on the job. However, the work environment has a significant effect on the transfer outcomes (Salas et al., 2006). Grossman and Salas (2011) maintain that even if training programs are delivered effectively, they can fail to yield positive training transfer outcomes when the work environment does not inspire the use of the required behaviours. The transfer climate, support, opportunity to perform and follow-up are critical components of the work environment.

Salas et al. (2006) postulate that when employees observe a positive transfer climate, they are more likely to apply trained or learned competencies on the job. A positive transfer climate has characteristics which include signs that induce employees to use new knowledge, consequences for using correct skills and remedies for using or not using the correct skills, social support from supervisors and peers by using incentives and feedback (Grossman & Salas, 2011). Gilpin-Jackson and Bushe (2007) identify a supportive transfer climate for trainees as the greatest promotor of training transfer. Organisations that do not take transfer climate into account could really hinder their

training efforts. Generally, a positive transfer climate is crucial for the application and maintenance of new knowledge and skills on the job.

Supervisors may offer support to their employees in several ways and at various phases in the training process. Peer and supervisor support adequately encourage the tendency for employees to use trained and targeted competencies on the job (Grossman & Salas, 2011). Taylor et al. (2005) suggest that supervisors should encourage their employees to set proximal and distal goals required for applying new competencies in the workplace.

Locke and Latham (2002) emphasise that goal setting can facilitate training transfer by stimulating action, directing attention, increasing persistence and encouraging employees to use new knowledge and skills. Generally, research has showed a positive correlation between training transfer and goal setting (Burke & Hutchins, 2007).

Supervisors may show support to their employees by offering rewards, recognition, encouragement and demonstrating trained behaviours (Salas & Stagl, 2009; Salas et al., 2006). In addition, employees who receive greater levels of support from their supervisors, transferred more skills and knowledge after a year of participating in the training program, compared to those who received lower levels of supervisor support. Similarly, peer support indicated a consistent correlation with knowledge and skills transfer. In summary, the provision of both peer and supervisor support facilitate the transfer of training. Organisations should be confident that support is significant for knowledge and training transfer and it does not have to come from only one source.

Clarke (2002) identifies the greatest barrier to successful training transfer as the limited opportunity to perform skills on the job. Employees required plenty of opportunities to apply new skills in their workplace and this allowed positive transfer to take place (Burke & Hutchins, 2007). In an empirical study by Lim and Johnson (2002), trainees indicated the opportunity to utilise trained skills as the greatest form of support and conversely, the lack of opportunity to use trained skills as the largest hinderance to transfer knowledge. Salas et al. (2006) suggest that trainees need the

necessary resources and opportunities to apply new skills and knowledge to the workplace for training transfer to be successful.

Grossman and Salas (2011) stress that the completion of structured training should not be the end of the learning practice. Once training has been completed, this presents various opportunities to enhance and further maintain the learning which has taken place (Salas & Stagl, 2009). They further suggest that once training has been completed, employees should reflect on their training experience and follow up with practice and discussion. According to Blume et al. (2010), supervisors and training facilitators should consider offering post-training follow-up and feedback sessions.

Informational, procedural, decision-making and coaching aids are some of the various job aids that can be utilised to enhance training transfer. Job aids simplify and enable transfer by offering critical instructions and other reference material, which reduce the mental workload needed to apply new knowledge and skills in the workplace (Salas et al., 2006). Blume et al. (2010) found that post-training interventions such as self-management, relapse prevention, training in self-talk, goal setting and post-training facilitator follow-ups, indicated a positive effect on training transfer.

2.7 SUMMARY

The aim of chapter 2 was to understand the association of drivers of technical skills and knowledge transfer through an extensive literature review. This chapter further focused on classifying the various types of knowledge and how they are transferred. Knowledge was itemised as explicit, tacit, ambiguous and was found to occur in a personal and organisational capacity.

The main categorisation of the antecedents of knowledge transfer were found to be culture and trust, and the antecedents of organisational knowledge transfer were characterised as knowledge, organisational and network characteristics.

The significance of succession planning as a key enabler of succession planning was discussed extensively. Succession planning included mentoring and coaching programs. The literature indicated that the main benefits of succession planning

coincided with those of knowledge retention and knowledge transfer. Succession planning was found to play a critical role in the transfer of both tacit and explicit knowledge. Trainee characteristics, training design and the work environment are fundamental in the execution and sustainability of adequate knowledge transfer.

CHAPTER 3

METHODOLOGY

Technical Skills and Knowledge Transfer for an Aging Workforce in the Automotive Industry

3.1 INTRODUCTION

The purpose of this study was to investigate the drivers that enable technical skills and knowledge transfer in an automotive environment. To this end, in chapter 2, the literature review was presented. A conceptual framework was derived to investigate the drivers and strategies to achieve technical skills and knowledge transfer in an automotive organisation.

The purpose of chapter 3 is to present the methodology that was used for the empirical part of the study. In this chapter, the research design, sampling, data collection, ethics, data analysis methods, method of reporting and synthesising of the results are discussed.

3.2 RESEARCH PARADIGMS

Collis and Hussey (2014) define a research paradigm as rooted in human philosophies and assumptions about the nature of existence, knowledge and reality. A positivism paradigm was followed in this study. A research paradigm can be rooted in either positivism or interpretivism, which are clarified below.

3.2.1 Positivism

The positivism paradigm began in the biological disciplines and is deeply grounded in viewpoints of realism. Positivism presumes that societal authenticity is unbiased and it is not affected by any act of investigating it. In addition, the social phenomena can be measured. According to Collis and Hussey (2014), the methods of quantitative analysis are grounded in statistical data analysis which are associated with this paradigm. The sole objective of positivism is to prove a hypothesis using quantitative

data and deductive reasoning (Williamson & Johanson, 2017). Collis and Hussey (2014) are of the opinion that positivists use philosophies to forecast societal phenomena while applying rational thinking so that their research can be grounded in objectivity, precision and rigour, instead of objectivity and intuitive reasoning.

3.2.2 Interpretivism

Interpretivism can be explained as a paradigm which originated from the censure of positivism. Interpretivism is grounded in the viewpoint of idealism and believes that societal reality is independent and compound, hence it is influenced by the fact of being investigated. This research method seeks to construe societal phenomena within a given setting, due to the nature of its inductive reasoning style (Collis & Hussey, 2014). Interpretivism is founded on the notion that social realism is transformed by beliefs, hence it is highly subjective.

Other types of methods are used by interpretivists which attempt to define and interpret the meaning, as opposed to the rate of recurrence of social phenomena. Unlike the positivist quantitative approach, the interpretive research approach generally derives results from qualitative methods of analysis, rather than from statistical analysis of quantitative data (Williamson & Johanson, 2017).

3.2.3 Critical theory

Kincheloe and McLaren (2011) document that critical theory is broadly interested in topics of power, fairness and manner that the economy, class, ethnicity, gender, religion, discussion, ideology, learning, cultural dynamics and social customs interact to develop a social system. Williamson and Johanson (2017) emphasise that critical theorists in their criticism of the positivist view are similar to interpretivists, although they are of the view that reality is constructed or interpreted by social groups or individuals. They further allude to that fact that critical theorists have opposing views to interpretivists.

3.2.4 Positivism vs. Interpretivism

Collis and Hussey (2014) present the main distinctions in the research characteristics of positivism and interpretivism in the list below.

Characteristics of positivism:

- Big samples are used.
- Holds a non-natural location.
- Focus on assessing the hypothesis.
- Yields accurate, impartial, quantitative statistics.
- Yields outcomes with high reliability, but low validity.
- Allows outcomes to be drawn from the sample.

Characteristics of interpretivism:

- Small samples are used.
- Holds a natural location.
- Focus on creating philosophies.
- Yields high independent and qualitative statistics,
- Yields results with low reliability, but high validity.
- Allows results to be applied from one location to another similar location.

This study used a positivism paradigm with quantitative research methods. Williamson and Johanson (2017) list the following steps for a positivist research approach:

- a) Main topic of concern. In this study, the topic of interest is technical skills and knowledge transfer in an automotive organisation, due to institutional knowledge being lost.
- b) Review of literature and the development of theories. In chapter 2, an overview was presented of knowledge transfer, management of scarce skills, succession planning, trainee characteristics, training design, work environment and knowledge retention.
- c) Development of the methodology. In chapter 3, the empirical study methodology is discussed which includes an overview of the research

questions, the positivist paradigm, the methods of research, collection of data and techniques of analysis.

- d) Selection of a sample and the collection, analysis and interpretation of data. Chapter 4 will discuss the collection, analysis and interpretation of the data from the 168 respondents in the study.
- e) Answers to the research questions offered or hypothesis proven/not proven. In Chapter 5, answers to the research questions will be discussed to determine if the independent variables positively influenced technical skills and knowledge transfer (dependent variable).
- f) Writing of outcomes. Chapter 5 will also include the writing of the results, recommendations and conclusion.

A close-ended questionnaire was formulated. The questionnaire was uploaded on QuestionPro and emailed to the respondents to complete. Respondents who did not have access to a computer or email address, were allowed to use two computers which were provided by the human resource department to enable them to complete the survey online. Anonymity was maintained as the questionnaire did not require the respondents to provide their names.

Statistics produced from the respondents' results were used to test whether the independent variable positively influenced the dependent variable. The independent variables were drivers of technical skills/knowledge transfer and the dependent variable was technical skills/knowledge transfer. The main benefit of using the positivistic research approach is that results are not regarded as instinctive, because the method is objective and accurate. Positivism predominantly trends to make use of large samples. Furthermore, with a qualitative paradigm, reliability is noted to be high, but with a low validity (Collis & Hussey, 2014). In this study, the managerial problem examined was inadequate technical skills and knowledge transfer for new generation employees in a particular automotive company.

3.3 RESEARCH APPROACH

A quantitative research approach was selected for this study. This method is different to a qualitative, participative research approach and is discussed below.

3.3.1 Quantitative Research

Cooper and Schindler (2011) define quantitative research as the accurate measure of manners, attitude, insight or belief. Quantitative research is constructed on deductive methods focused on validating or invalidating existing theories. This technique involves testing relationships and measuring constructs amongst variables to discover or recognise relationships, patterns or contributory relations (Leavy, 2017). Cooper and Schindler (2011) state that a dominant technique of collecting data is known as a survey.

3.3.2 Qualitative Research

Cooper and Schindler (2011) define qualitative research as an interpretive method that tries to identify, translate and decode the meaning, not the frequency or a particular phenomenon. Qualitative research involves the use of distinct wisdom, group discussions, recording participants, videoing respondents, observing, mental examination and case studies. Qualitative research is constructed on inductive logics that contribute to understanding to establish reasoning. When the aim of a study is to explain, explore and describe a phenomenon, this technique is appropriate.

3.3.3 Participatory Research

Leavy (2017) describes community-based participatory research as a partnership between academics and non-academic participants. The aim of this type of approach is to ensure that community members are actively engaged throughout the process, from problem identification to the sharing of results. It is a highly collaborative technique targeted at problem-solving and involves the sharing of power.

3.3.4 Quantitative vs. Qualitative Research

The combination of quantitative and qualitative data in an empirical study is known as mixed methods research. It is commonly used in behavioural science and applied social research (Leavy, 2017).

The key differences between quantitative and qualitative research as provided by Cooper and Schindler (2011), are depicted in Table 3.1 below.

Table 3.1: Quantitative VS. Qualitative Research

Research Characteristic	Quantitative	Qualitative
Research focus	Define, clarify & forecast	Comprehend & construe
Research participation	Partial – restricted /unbiased	High – contributor or facilitator
Research intention	Define or forecast – construct and examine hypothesis	Comprehensive insight – build hypothesis
Sample design	Probability	Non-probability
Sample size	Large	Small
Research design	Established prior to initiating research study Utilises single or mixed approaches Consistency is critical Longitudinal method/approach	May change during the study Uses multiple approaches Stability is not envisaged Longitudinal method/approach
Participant preparation	No planning needed – limits bias	Typically involves pre-tasking
Data type & preparation	Verbal descriptions Altered to numerical codes for statistical analysis	Verbal or visual descriptions Altered to verbal codes
Data analysis	Usually statistical & mathematical methods Upholds clear distinction between facts & judgement Partly ongoing analysis	Primarily nonquantitative – requires human scrutiny after coding Unclear distinctions between facts & judgements Always ongoing throughout the entire research project Forces researcher to review conceptual framework
Insights & meaning	Limited to probing respondents & data quality Limited ability to re-interview respondents	In-depth level of understanding Researcher involvement allows insight to form & be tested
Feedback turnaround	Larger sample size enables longer data collection	Smaller sample enables quicker & shorter data collection

Research Characteristic	Quantitative	Qualitative
	Insight development follows data collection, extending the process	Insights are developed throughout the research process
Data security	Competitors become aware of research from insights that may be leaked	More robust from restricted access & smaller sample sizes

Source: Cooper and Schindler (2011)

3.4 DATA COLLECTION METHOD

Sources of data are usually categorised as primary or secondary sources, and internal or external sources. Primary data is raw data that is generated at the source for the first time for a particular purpose or reason. Data that already exist in a processed form of use is classified as 'secondary data' (Wegner, 2016).

Primary data allows for robust control over data collection. Its main advantage is that it is of superior quality due to its accuracy and relevancy. However, it generally consumes a lot of resources and time. This depends on the type data collection approach and the data source. Most researchers tend to use internal company databases as they are cheaper and faster (Wegner, 2016). Both primary and secondary data were used in this study. Internal company databases were used to collect primary data and the literature compiled in chapter 2 was used as secondary data.

3.4.1 Constructing the questionnaire/survey

Generally, the main intention of a survey is to explore the respondents' opinions by capturing what they feel, think, believe or do regarding certain variables in a research project (Collis & Hussey, 2014). In this study, the aim was to investigate whether the drivers of technical skills and knowledge transfer positively influence technical skills and knowledge transfer in an automotive organisation, using a questionnaire.

With reference to quantitative data analysis, a closed-ended questionnaire was used to collect primary data. The information in the literature review informed the compilation of questionnaire items which was guided by the secondary data. The construction of the measurement instrument was structured using guidelines provided by Babbie and Mouton (2015).

Babbie and Mouton (2015) recommend the following guidelines for constructing measuring instruments used for formulating and structuring questionnaires, namely:

- Include all probable anticipated choices.
- Response selections should be mutually exclusive to avoid duplication.
- Items must be displayed distinctly and unequivocally.
- In the question statement or question item, double-barrelled questions must be averted by restricting the use of 'and'.
- Questions must meet the required level of the target respondents (technical employees).
- Respondents should participate voluntarily.
- Questions must be relevant to the research objective.
- Bias items and terms should be avoided.
- Negative questions should be avoided to eliminate confusion and misinterpretation.

In this study, each questionnaire item was coded and captured using STATISTICAL and then decoded. Any spoiled survey and incomplete questionnaire item or question were discarded and excluded from the study analysis and results.

In this study, a mail survey encompassing a close-ended questionnaire was used. This method of collecting data using a mail survey was selected because it enables a large sample size to be questioned directly.

A mail questionnaire was used, which was forwarded to all employees in the organisation across all levels and this resulted in 168 respondents. The survey tested technical skills and knowledge transfer (dependent variable) and the drivers/strategies that promote technical skills and knowledge transfer (independent variable).

The first part of the questionnaire (Section 1) required the respondents to provide demographic details. All the mail survey questions related to the research variables were in a form of a Likert Scale to promote the use of inferential statistics, such as multiple regression analysis, which would assist in addressing the research questions. The respondents' observations were measured using a Likert Scale with answer options that ranged between (1) strongly disagree to (5) strongly agree.

The questionnaire consisted of 50 statements measuring the following:

a) Section 1:

- Demographics (7 items).

b) Section 2:

- Independent variable: Management of scarce skills (11 items).
- Independent variable: Succession planning (10 items).
- Independent variable: Trainee characteristics (8 items).
- Independent variable: Training design (6 items).
- Independent variable: Work environment (8 items).
- Dependent variable: Technical skills and knowledge transfer (7 items).

3.5 POPULATION AND SAMPLING DESIGN

A population is a distinct set of people or objects observed for statistical reasons (Collis & Hussey, 2014). In this study, the population was 300 technical employees, which included both newly appointed employees and soon to be retired technical employees at an automotive company in Port Elizabeth, South Africa. A sample is defined as a sub-set of a population. Furthermore, a sampling frame is defined as a population register which is used to select a sample (Collis & Hussey, 2014). A sampling unit is defined as an item which is measured, counted or observed in relation to the random variable under investigation (Wegner, 2016). For this study, technical employees at an automotive company based in Port Elizabeth, Eastern Cape, South Africa formed the sampling unit. To obtain this, an employee list provided by the human resource department was used as the sampling frame to select the sampling unit. The sample was 168 technical employees of an automotive company (n=168).

According to Wegner (2016), sampling can either take the form of random (probability) sampling or non-random (non-probability) sampling. Selection criteria where a sampling unit is selected unintentionally from the target population, refers to probability sampling. A probability or random sample is unbiased and respondents have the same opportunity to be selected (Collis & Hussey, 2014).

There are four random sampling methods that exist, which are simple, cluster, stratified or systematic random sampling. In a simple random sample, every unit in a selected population will have an equal opportunity of being chosen. In a systematic random sample, the first step is to randomly select the initial unit, then participants are selected consistently at every interval in relation to the initial selected unit. The stratified random sampling method consists of splitting the population into portions, from which random units are selected. Cluster random sampling is a method of dividing a population into clusters of similar contours from which the unit is selected.

An alternative to random sampling is non-random sampling. A non-random sample is known to be biased, since the selection of the units is not done randomly from the target population. Similarly, there are four non-probability sampling methods: convenience sampling, judgement sampling, quota sampling and snowball sampling. Convenience sampling usually takes place in the presence of the investigator. Judgement sampling is grounded uniquely at the judgement of the investigator when selecting the best suitable unit. Quota sampling includes having quota limits on units which are set to conduct an interview from precise population sub-groups. Snowball or network sampling occurs other members of the population are chosen by the selected sampling units to part of a sample (Wegner, 2016).

According to Babbie and Mouton (2015), convenience sampling can be described as surveying a representative sample from one company, instead of surveying numerous companies within a certain industry. In this study, the convenience sampling method was selected. This method was considered the most suitable for this study because the technical employees of an automotive company were surveyed within the automotive industry, which allowed for cost effective, efficient and simpler data collection methods.

3.6 ETHICAL ISSUES

In this section, ethics and moral principles will be discussed. Ethics refers to the moral principles or values which are founded by the basic code of conduct practices. Research ethics is defined as the way in which research is conducted and the manner in which the outcomes and assumptions are stated (Collis & Hussey, 2014).

Collis and Hussey (2014) provide a list of research ethics and principles:

- Informed permission: the requirement to ensure that respondents are completely knowledgeable and provide consent for their participation.
- Damage to respondents: the obligation to circumvent probable damage through research practice and to guarantee the psychological and physical well-being of respondents, the researcher and others.
- Confidentiality: the requirement to protect the confidentiality of data related to individuals, groups or organisations.
- Dignity: the obligation to honour the dignity of respondents, the investigator and organisation.
- Confidentiality: the need to safeguard the privacy of respondents or to circumvent any invasion of privacy.
- Anonymity: the requirement to protect the anonymity of the participants and others.

It is imperative to note that the above-mentioned principles are aligned with the Nelson Mandela University Business School ethics code of conduct. The research ethics protocol and principles of the Nelson Mandela University were maintained in this study, with ethics approval reference number: H20-BES-BUS-057. Confidentiality and anonymity were addressed with a consent letter attached to the first page of the questionnaire as a cover letter. A gatekeeper consent letter was signed by the Plant Director and Human Resource Manager, permitting their employees to participate in the survey, only if the confidentiality, dignity and anonymity of the participants were duly safeguarded and would not harm their well-being. This research treatise was submitted through a software package designed to notice and measure the degree of plagiarism, thus ensuring plagiarism was avoided. The software is known as Turn-It-

In. The Turn-it-In maximum limit, as prescribed by the Nelson Mandela University, is 20% or less with no single source reflecting more than 2%. The Turn-It-In report depicted a rate of 16% and is attached as Appendix 4.

3.7 DATA ANALYSIS METHOD

Babbie and Mouton (2015) explain that statistical analysis is part of the quantitative paradigm. They further indicate that quantitative research uses data to describe a phenomenon and includes collecting numerical data from across a group of people referred to as respondents. STATISTICA is a software programme used to analyse data collected from a sample and was used in this study.

3.7.1 Descriptive statistics

Generally, descriptive statistics are used to explain fundamental data and information about the variable being investigated. The spread, location and shape of the data are determined using descriptive statistics. The most common measures of central tendency are means, modes and medians, although standard deviations and ranges are generally used to explain the form and spread of the data, with dispersion included (Wegner, 2016). Furthermore, dispersion is a critical measure that indicates the variability of data that affects reliability. In this study, each questionnaire item was interpreted using descriptive statistics.

3.7.2 Inferential statistics

The use of inferential statistics is a method applied to examine legitimate relationships or patterns in a population, in relation to the data collected from the sample (Wegner, 2016). Pearson correlation, multiple regression analysis and multi-collinearity tests were applied and are discussed in the following sections.

3.7.3 Pearson Correlation

Hair et al. (2015) describe Pearson correlation as a linear relationship between two variables. Furthermore, a correlation coefficient is a value that demonstrates Pearson

correlation. Generally, the higher the correlation coefficient, the stronger the relationship and the greater the correlated variation. Wilson (2015) highlights the correlation coefficient rule of thumb as depicted in Table 3.2 below.

Table 3.2: Rule of thumb - Correlation Coefficient

Coefficient Range (r)	Correlation or Interpretation
$r = 1.00$	Perfect correlation
$+0.70 \leq r \leq +0.99$	Very positive relationship
$+0.40 \leq r \leq +0.69$	Strong positive relationship
$+0.30 \leq r \leq +0.39$	Moderate positive relationship
$+0.20 \leq r \leq +0.29$	Weak positive relationship
$+0.01 \leq r \leq +0.19$	No or negligible relationship
$-0.01 \leq r \leq -0.19$	No or negligible relationship
$-0.20 \leq r \leq -0.29$	Weak negative relationship
$-0.30 \leq r \leq -0.39$	Moderate negative relationship
$-0.40 \leq r \leq -0.69$	Strong negative relationship
-0.70 or higher	Very strong negative relationship

Source: Wilson (2015)

3.7.4 Multiple Regression Analysis

To determine a single dependant variable in multiple regression analysis, numerous independent variables are entered into the same form of regression analysis equation. Furthermore, a respective coefficient is determined for each independent variable, which depicts its single correlation with a dependent variable (Hair et al., 2015). Wegner (2016) stresses that the objective of multiple regression analysis is to describe an array of independent variables that will be significantly related to the dependent variable. Hair et al. (2015) maintain that multiple regression is a better realistic predictor, because ordinary occurrences usually rely on multiple factors. In this study, multiple regression was used to determine the drivers of technical skills and tacit knowledge transfer and its effectiveness in promoting technical skills and knowledge transfer. Furthermore, multiple regression in regression analysis seeks to determine a set of independent variables that are significantly related to the dependent variable.

The coefficient of determination (r^2) is used to define how strong the correlation is between the independent and the dependent variable. Furthermore, the coefficient of

determination measures the extent of variation that the independent variable influences the dependent variable (Wegner, 2016). The coefficient of determination in multiple regression is referred to as the multiple coefficients of determination and is denoted as R^2 (Hair et al., 2015). In social sciences, the rule of thumb considers an R^2 value lesser or equal to 0.09 to have small relation, R^2 value between 0.1 and 0.3 to have moderate relation, and R^2 value greater or equal to 0.3 to have a large relation.

3.7.5 Multi-collinearity

As a result of the degree of the research questions, which included an evaluation of interrelated drivers of skills and knowledge transfer, the relationship between the research hypotheses was inclined to multi-collinearity. It is paramount to note that even though the independent variables explain or predict the value of the dependent variable, it does not suggest that the variables are independent from a statistical perspective.

No correlations between the independent variables and other independent variables are defined by a value of 1. Moderate correlations are described by values between 1 and 5. Values greater than 5 suggest coefficients are inadequately predicted and represent critical levels of multi-collinearity.

A value of 1 means that there is no correlation between this independent variable and any others. VIFs between 1 and 5 suggest that there is a moderate correlation, but it is not severe enough to warrant corrective measures. VIFs greater than 5 represent critical levels of multi-collinearity where the coefficients are poorly estimated, and the p-values are questionable.

3.7.6 Reliability test

Hair et al. (2015) define reliability as the degree to which the item range does not have random unsteady error, thus the degree of reliability is present in its measurement result. The three forms of internal consistency reliability are listed below.

- Split half reliability, which is established by dividing the group of scale items in half and correlating both the two sub-sets of items. A high correlation between the two halves indicates a high reliability. In academic research, this type of reliability is generally not applied.
- For this study, the reliability test that was conducted was Cronbach's Alpha. One of the three forms of internal consistency reliability is the coefficient alpha, commonly known as Cronbach's Alpha, which is attained by determining the average of the coefficients from probable combinations of split halves (Hair et al., 2015). A Cronbach's Alpha of 0.6 is regarded as fair, while a value of 0.7 and above is considered as good (Zikmund et al., 2013). Table 3.3 below, indicates how to interpret the value of Cronbach's Alpha.
- A more accurate reality test is composite reliability, which is similar to Cronbach's Alpha, which used weighted items in relation to its own reliability (Hair et al., 2015).

Table 3.3: Interpretation intervals for Cronbach's Alpha

Interval	Interpretation
0.8 and above	Excellent
0.70 – 0.79	Good
0.60 – 0.69	Fair
0.50 – 0.59	Poor
Less than 0.50	Unacceptable

Source: Tavakol and Dannick (2011)

Table 3.4: Cronbach's Alpha - Reliability of the measuring instrument (n=168)

Variable	Cronbach's Alpha
Scarce skills	0.84
Succession planning	0.85
Trainee characteristics	0.77
Training design	0.65
Work environment	0.80
Technical skills	0.73

Based on the study results, it is evident that the measuring instrument is considered as reliable, since a Cronbach's Alpha value of above 0.60 was obtained.

3.8 METHOD OF REPORTING AND SYNTHESIS

The results of this study were produced by the use of interpretations, conclusions and recommendations informed by statistical results. The demographics of the sample, which is all technical employees at an automotive plant, were portrayed graphically and then interpreted. As indicated in the questionnaire, the demographic analysis information on gender, age-group, education-level, occupation-level and employee tenure were provided.

Cronbach's Alpha is a reliability test used to measure the reliability of the measuring instrument. Based on the results of this study, it was not necessary to conduct an Exploratory Factor Analysis (EFA) to interpret and provide the construct validity of the instrument items, because the Cronbach's Alpha attained per variable, was good. Therefore, the measurement instrument was considered as reliable.

3.9 PRESENTATION OF DEMOGRAPHICAL INFORMATION

3.9.1 Demographics

The demographics of the 168 respondents are depicted in Figures 3.1 to 3.6 below. The sample consisted of 70% males and most of the respondents were between the ages of 36 and 55 years, as illustrated in Figure 3.1 and Figure 3.2.

Figure 3.1: Gender (n=168)

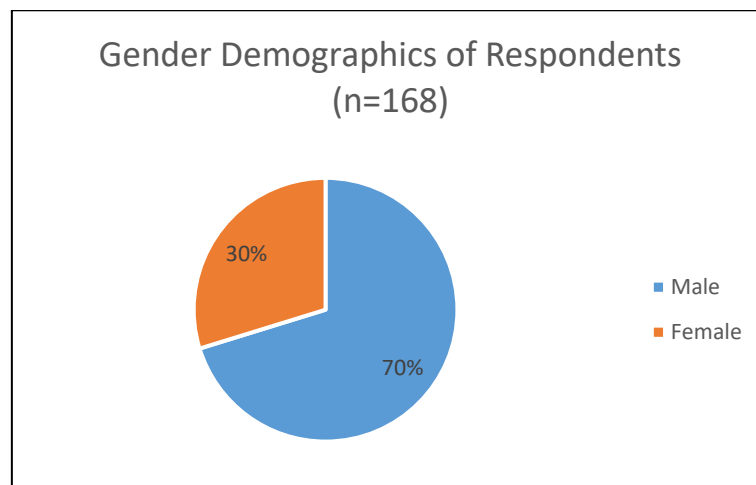


Figure 3.2: Age and Gender (n=168)

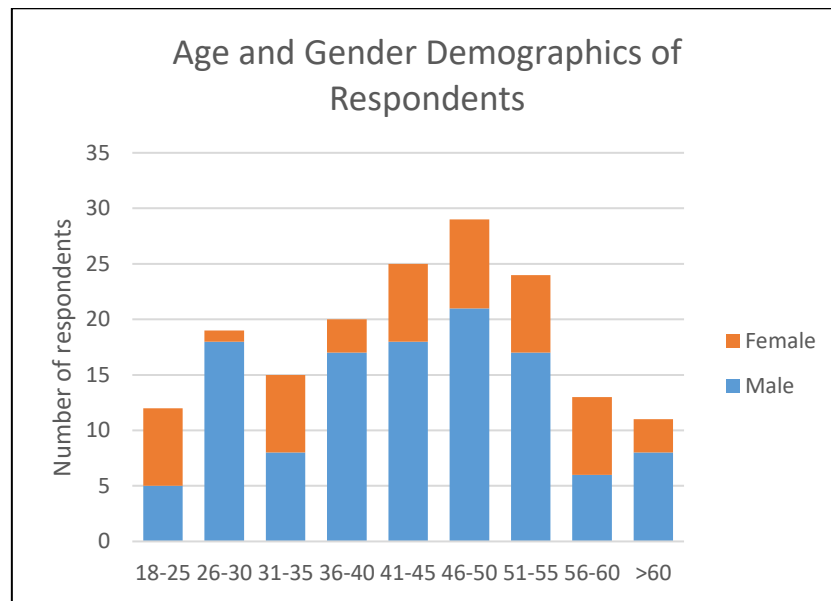


Figure 3.3 below shows that 67% of respondents had a matric qualification, 14% of respondents had a technical qualification and 19% of respondents had a tertiary or university qualification.

Figure 3.3: Qualification level (n=168)

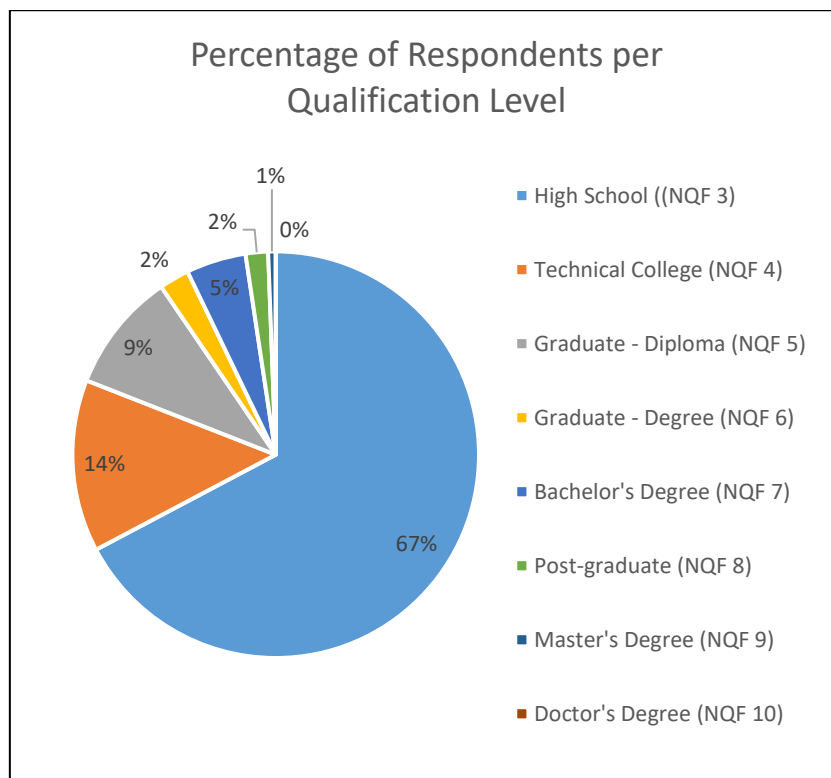


Figure 3.4 below indicates the occupational level of the respondents. It shows that 77% of respondents were technical employees (e.g. trainee, graduate, operator, setter, team leader, picker/packer, inspector, spray painter, welder) based on the shop-floor and 11% of respondents were advanced technical employees (e.g. supervisor, fitter, electrician, millwright, technician, engineer, specialist, tool maker), conducting maintenance or engineering support functions. The rest of the respondents were administrative employees (11%) which included administrative, managerial and others.

Figure 3.4: Occupational level (n=168)

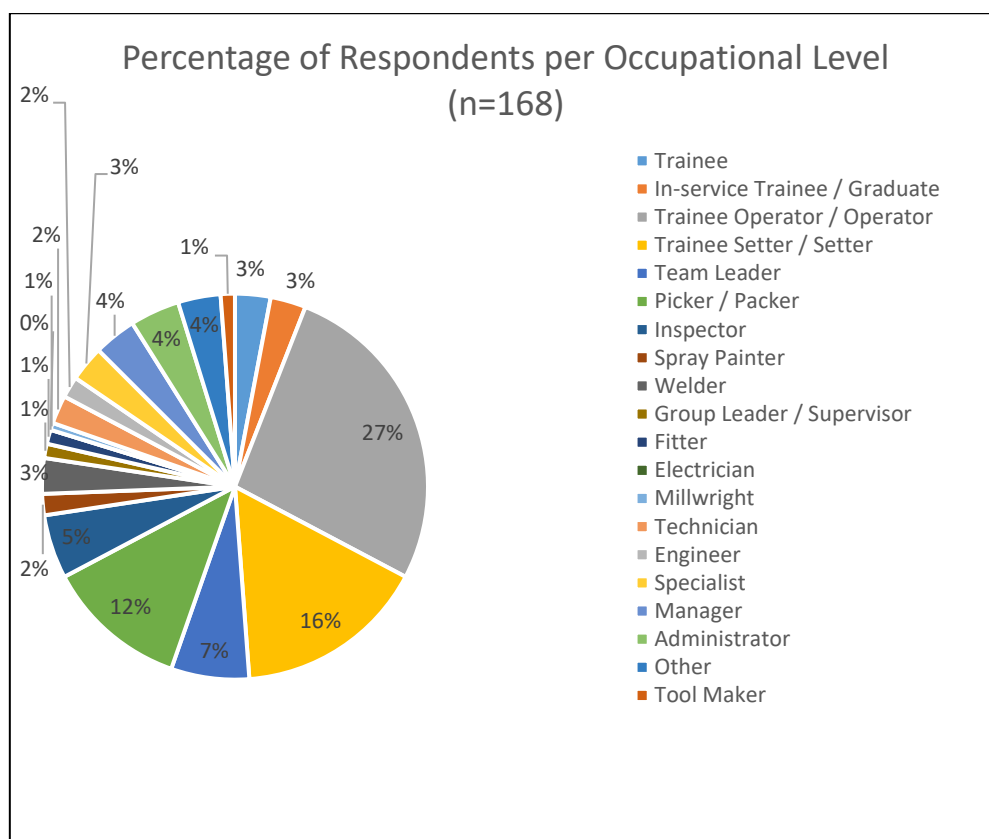


Figure 3.5 below presents the tenure and qualification of the respondents. It shows that many respondents had a relatively short tenure with the organisation. The implications of these demographics in terms of the study is that most of the respondents with less years of experience were more qualified or educated compared to the employees with the organisations for more than 35 years. There are a few employees with many years of experience, however the organisation will experience challenges for these tacit knowledge owners to share their knowledge with newer

employees, because of their difference in education level. It is important to note that one cannot assume that employees with less years of experience will be exposed to acquired knowledge and skills from these experienced employees. Literature indicates that technical skills and tacit knowledge are mostly gained through experience and not through formal education.

Figure 3.5: Tenure and Qualification (n=168)

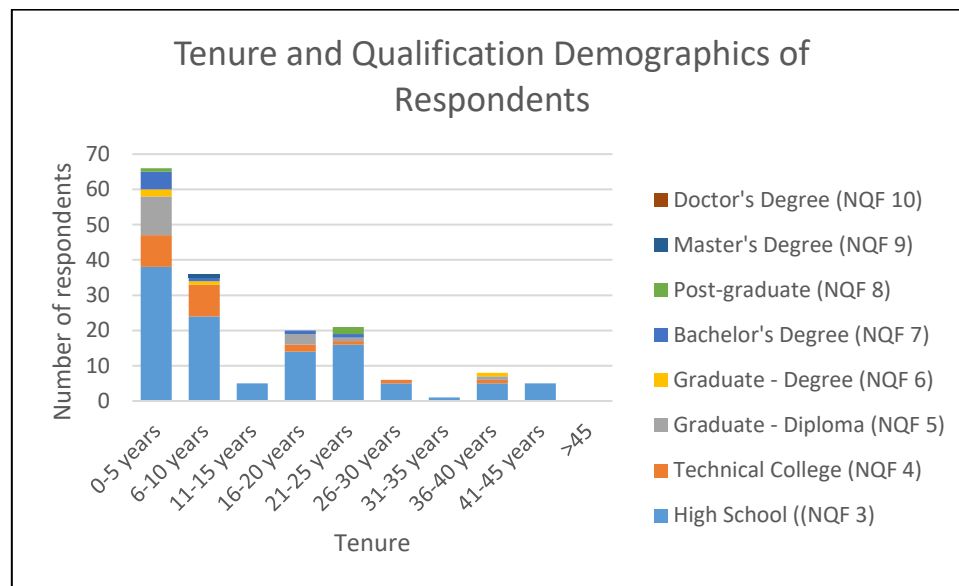


Figure 3.6 below indicates that 60% of the sample had a tenure of between 0 to 10 years, (39% of respondents with 0 and 5 years, and 21% with 5 and 10 years). Sixty seven percent of the sample had a high school qualification or below, as indicated previously in Figure 3.3.

Figure 3.6: Tenure and Age (n=168)

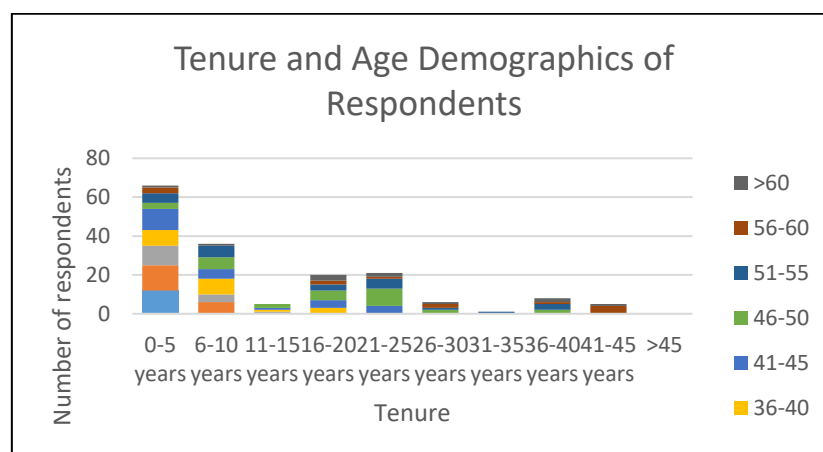


Table 3.5: Department (n=168)

Department	Number of Respondents per Department	Percentage % (n=168)
Rod Shop	31	18.5
Top-end Welding	5	3.0
Cut-off shop	12	7.1
Base Assembly	21	12.5
Final Assembly	20	11.9
Paint Shop, Mount & CARE	16	9.5
Finish Goods Store	17	10.1
Component Stores	14	8.3
Maintenance	5	3.0
Quality	5	3.0
Safety	2	1.2
Logistics	3	1.8
Eng. - CI, Development, Process	6	3.6
Finance / Sales	5	3.0
Human Resources	2	1.2
Procurement	3	1.8
Other Support Services	1	0.6

In Table 3.5, the first eight departments represented were production/shop-floor departments. These represented 81% of the sample and the support departments comprised 19%. More than 50% (10% of sample size) of the support departments were technical/engineering departments.

3.10 SUMMARY

Chapter 3 discussed the research design and methodology used for evaluating drivers of tacit knowledge and skills transfer required for obtaining technical skills and knowledge transfer in an automotive environment. Positivism and quantitative approaches were selected as the theories of application for this study. An overview of the literature provided insight about the research approach followed. The data collection method, population and sampling design, data analysis, ethical concerns, method of syntheses and reporting the outcomes were deliberated.

CHAPTER 4

DESCRIPTIVE AND INFERENTIAL STATISTICS

Technical Skills and Knowledge Transfer for an Aging Workforce in the Automotive Industry

4.1 INTRODUCTION

Chapter 3 discussed the methodology used for testing the drivers of knowledge and technical skills transfer. This included the paradigm, research method, questionnaire development and methods of analysis. The reliability of the questionnaire was demonstrated and the biographical data of the sample group was presented.

The objective of chapter 4 is to answer the research question: Does the management of scarce skills, succession planning, trainee characteristics, training design and work environment positively influence technical skills and knowledge transfer? The answers are revealed through descriptive and inferential statistics.

4.2 DESCRIPTIVE STATISTICS

In this section, the aggregate mean scores for each variable are presented. Thereafter, the descriptive statistics (percentages, mean scores and standard deviations) for the different scales are presented. Figure 4.1 depicts the average scores per variable based on the empirical study.

Figure 4.1: Average responses per variable (n=168)

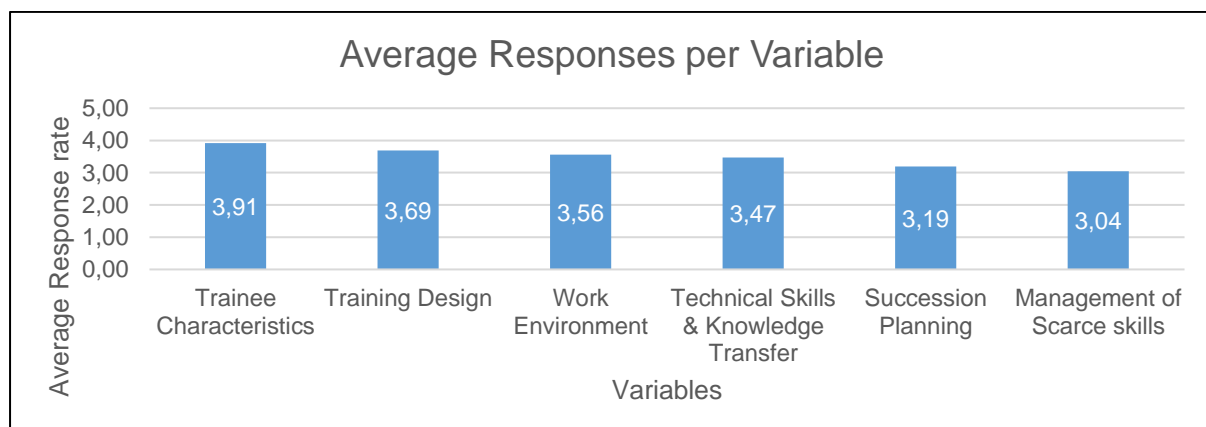


Figure 4.1 shows the means scores per the dependent variable and the independent variables, the dependent variable being technical skills and knowledge transfer, and the independent variables being management of scarce skills, succession planning, trainee characteristics, training design and work environment. The results are ranked from the highest average to the lowest. The figure suggests responses for trainee characteristics, training design and work environment, technical skills and knowledge transfer ($\bar{x} = 3.47$) lean towards agree responses, while succession planning and management of scarce skills lean towards neutral. As such, it appears that the respondents believed that technical skills and knowledge transfer did not take place, but succession planning and management of scarce skills were less evident.

Figure 4.2 depicts the distributions of responses via Likert scale ranking. Skewness is also included per variable.

Figure 4.2: Distribution of responses per variable (n=168)

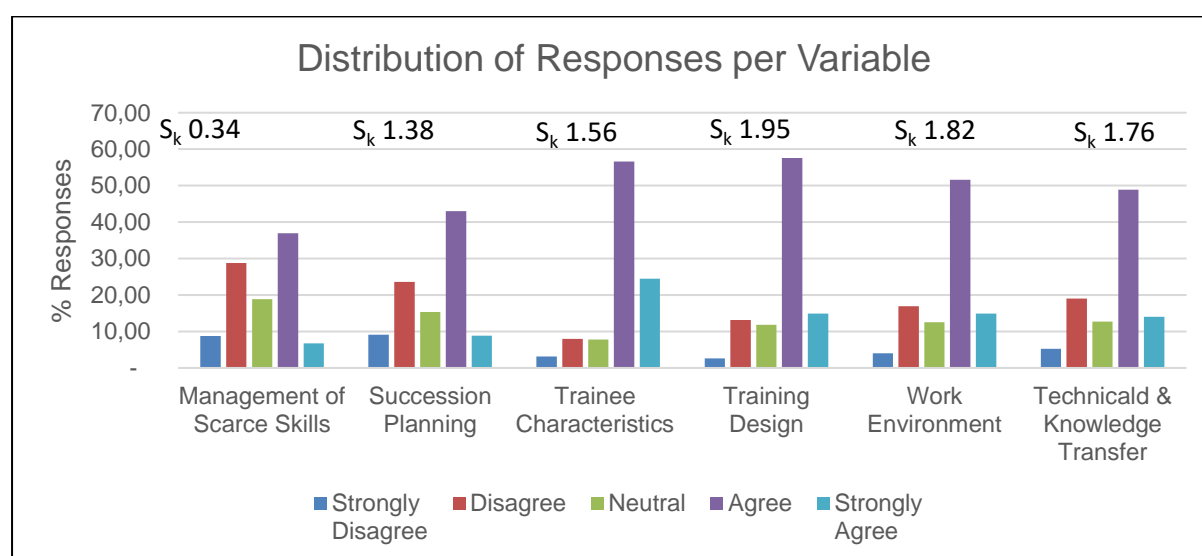


Figure 4.2 shows that all of the independent variables and dependent variable were positively skewed. Technical skills and knowledge transfer (dependent variable) showed a skewness of 1.76, whereas the skewness of the independent variables ranged between 0.34 and 1.82. Generally, most respondents agreed and strongly agreed with the question items presented in each variable (61%). However, disagree was the second highest most frequent response in this study (19%). Strongly disagree, was the least selected response (6%).

In the following section, descriptive statistics for all of the items for each factor are presented, starting with technical skills and knowledge transfer (dependent variable).

4.3 TECHNICAL SKILLS AND KNOWLEDGE TRANSFER

The distribution of responses is depicted in Table 4.1. with the mean, median and standard deviation per item.

Table 4.1: Technical Skills and Knowledge Transfer Item

Technical Skills & Knowledge Transfer	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
I am willing to be coached / trained by my seniors or experienced employees	5.36	2.98	91.67	4.19	0.781
Employees are equipped with tools, skills and knowledge on how to handle potential errors / failures	16.67	14.29	69.05	3.60	0.911
My manager provides the necessary support I need to perform my duties as expected	18.45	13.10	68.45	3.59	1.057
My line manager knows my skills gaps	23.21	14.88	61.90	3.47	1.099
My manager provides feedback on my performance	29.76	8.93	61.31	3.38	1.167
Experienced employees at my company have a structured and well documented training plan to train new or junior employees	33.33	16.67	50.00	3.18	1.096
Employees are encouraged to explore and make mistakes	43.45	18.45	38.10	2.91	1.162
	<u>Aggregate mean score</u>			<u>3.47</u>	

Responses for the first three items related to willingness to be coached, being equipped with tools, skills and knowledge and receiving support to perform duties showed a mean leaning towards agree. The items related to direct job performance speak more to personal development (e.g. skills gap identification, receiving feedback and being trained by experienced employees, being encouraged to explore and make mistakes). Responses to these items were lower. The second last item which refers

specifically to knowledge and skills transfer from experienced employees in a structured and documented manner received a lower mean score (3.18), indicating neutral responses. Based on the results obtained, the respondents indicated they agreed with knowledge transfer practices in the organisation with mean scores ($\bar{x} > 4.0$) in terms of employees showing willingness to be trained by others.

Most respondents were neutral or undecided about the existence of knowledge transfer being practised in their organisation ($2.0 < \bar{x} < 4.0$), in terms of receiving feedback from their managers/supervisors, experienced employees having a structured/documentated training plan, employees being equipped with problem-solving tools, line managers being aware of their direct reports' skills gaps, and the organisation encouraging employees to explore and make mistakes (explorative learning).

Figure 4.3 represents the results of the aggregate mean scores obtained for the scales of technical skills and knowledge transfer. These are ranked from the highest to the lowest mean.

Figure 4.3: Technical Skills and Knowledge Transfer responses per department

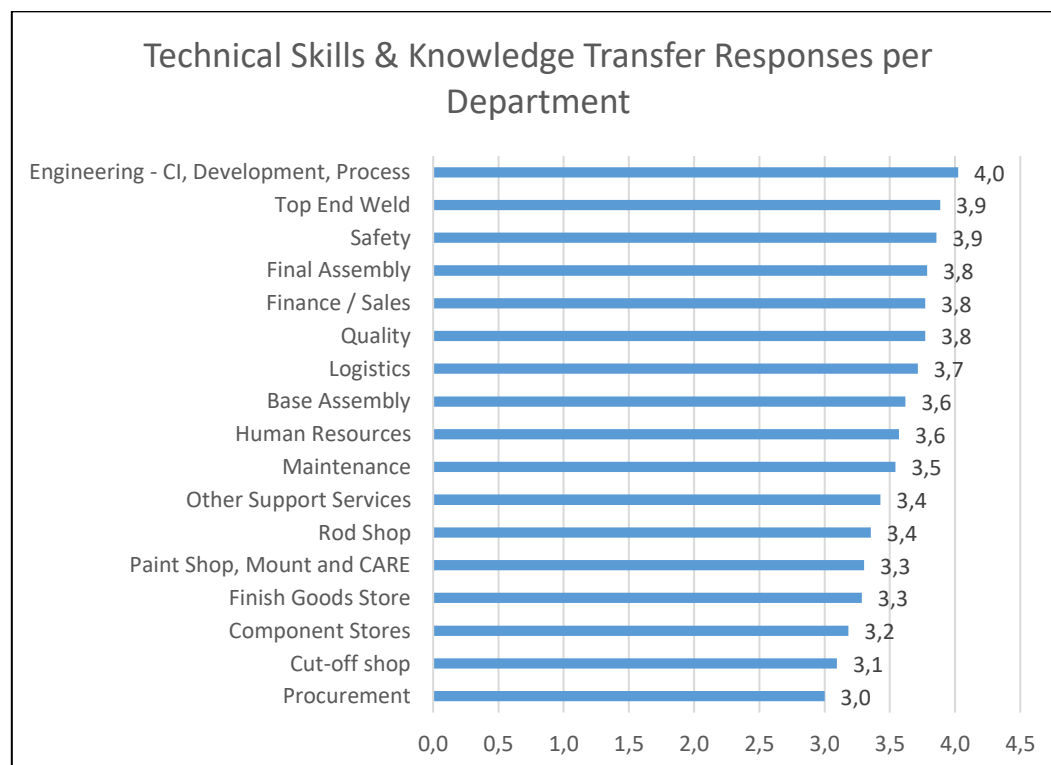


Figure 4.3 indicates that only the engineering departments displayed greater levels of the existence and practice of technical skills and knowledge transfer in their respective departments. The respondents agreed that technical skills and knowledge transfer took place in engineering, top-end welding, safety, final assembly, sales, quality, logistics, base assembly and maintenance, but less so in other support services, rod shop, paint shop, component stores, cut off shop and procurement.

The results for the drivers of technical skills and knowledge transfer, including their aggregate mean scores and standard deviation are discussed below.

4.4 DRIVERS OF TECHNICAL SKILLS AND KNOWLEDGE TRANSFER

Five potential drivers of technical skills and knowledge transfer were investigated using questionnaire items. These are management of scarce skills, succession planning, trainee characteristics, training design and work environment. The results are depicted in the section below.

4.4.1 Management of scarce skills

The distribution of responses is depicted in Table 4.2 with the mean, median and standard deviation per item.

Table 4.2: Management of Scarce Skills Item

Management of Scarce Skills	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
When a problem is outside the team's scope, a few experts/specialists are readily available to assist	18.45	14.29	67.26	3.55	0.965
The right people are recruited and effort is made to help them develop their skills	22.62	20.24	57.14	3.38	1.070
My company effectively fosters a high-performance work culture to retain talented employees	24.40	19.64	55.95	3.34	1.043

Management of Scarce Skills	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
May company effectively develops and nurtures employees' skills and talents	31.55	18.45	50.00	3.17	1.105
My company effectively identifies employees with special skills and talents	35.71	22.02	42.26	3.05	1.093
An internal pool of experts is ready to fulfil the requirements of highly specialised jobs	38.10	21.43	40.48	3.02	1.080
My company is effective in training employees in highly specialised jobs	39.29	19.05	41.67	2.99	1.100
When a highly skilled person resigns, performance and efficiency is maintained	41.07	21.43	37.50	2.98	1.105
When people retire, problems related to machines, equipment and processes are simply solved by junior employees	42.26	22.02	35.71	2.89	1.137
Replacements of experienced employees with scarce skills are planned sufficiently in advance	57.14	12.50	30.36	2.60	1.154
When a highly skilled person leaves, it is easy to find a replacement internally	62.50	16.07	21.43	2.48	1.126
	<u>Aggregate mean score</u>			<u>3.04</u>	

The aggregate mean score of the management of scarce skills was 3.04. This indicated that on average the respondents were neutral about the management of scarce skills in their organisation. Table 4.2 showed that respondents agreed that there were experts within the organisations who were readily available to solve problems when they arose. More respondents indicated that management recruits the right people for the jobs and effort is made to develop their skills compared with those who felt neutral or disagreed with the mean score, showing a tendency towards neutral. Furthermore, more respondents agreed that the organisation fostered a high-performance work culture that enabled the retainment of talented employees. However, more respondents disagreed with the presence of effective training of

employees for highly specialised jobs, advance planning and replacement of experts. More respondents indicated that it was difficult for management to replace experts with internal candidates. These results tend to show that the management of scarce skills, as well as the transfer of scarce knowledge and skills were problematic.

4.4.2 Succession planning

The distribution of responses is depicted in Table 4.3, with the aggregate mean score, median and standard deviation per item, ranked from highest to lowest mean scores. Succession planning is a key enabler of knowledge retention and transfer. Good succession planning best practices must be adopted to ensure knowledge is not lost as employees advance in an organisation or exit the organisation.

Table 4.3: Succession Planning Item

Succession Planning	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
Employees have opportunities to work comfortably with senior / experienced employees	20.83	12.50	66.67	3.57	1.098
My Personal Development Plan (PDP) is linked to my career path	22.62	11.31	66.07	3.45	1.066
My Personal Development Plan (PDP) is clear	24.40	12.50	63.10	3.45	1.120
My Personal Development Plan (PDP) makes provision for external training modules and courses to support my career path	28.57	13.10	58.33	3.30	1.109
My line manager knows my skills gaps and reviews my progress on regular basis	33.33	14.29	52.38	3.23	1.177
My manager manages employees with a view of preparing them for future succession	33.93	16.07	50.00	3.15	1.158
Employees are developed and trained adequately for future role(s)	38.10	16.67	45.24	3.07	1.084
In my company, employees have equal opportunities for growth and development	40.48	14.29	45.24	2.99	1.176

Succession Planning	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
Promotion processes are transparent	39.88	20.83	39.29	2.91	1.168
Promotion decisions are fair	45.24	22.02	32.74	2.77	1.227
	<u>Aggregate mean score</u>			<u>3.19</u>	

The overall presence of succession planning was lower ($\bar{x} < 3.5$) in this study. This showed that succession planning was not effectively implemented in the organisation. Most respondents indicated that promotion decisions and processes were not fair and transparent. Respondents further indicated that employees were not adequately trained and developed for future roles. However, most respondents indicated that their individual development plans were clear and linked to their career path. Succession planning is one of the key areas that the organisation should start focusing on to achieve increased technical skills and knowledge transfer.

4.4.3 Trainee characteristics

Table 4.4 presents descriptive statistics for trainee characteristics. This factor is important to technical skills and knowledge transfer as employees also need to take responsibility for their development and careers. Trainees must demonstrate positive attitudes towards learning and problem solving. A good relationship between the trainee and mentor/trainer will encourage the experienced employee to share their tacit knowledge.

Table 4.4: Trainee Characteristics Item

Trainee Characteristics	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
I eagerly learn from others whenever I can	6.55	2.98	90.48	4.14	0.871
My work behaviour shows that I believe that every employee is responsible for his/her area of work	5.36	2.98	91.67	4.10	0.739
I willingly invest effort in my work. I persist in my work even in the face of difficulties	5.95	5.36	88.69	4.10	0.813

Trainee Characteristics	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
I look forward to learning new skills during training and applying them in my job	11.90	5.36	82.74	3.96	1.020
I see myself being able to perform highly specialised jobs in the near future, if given a chance	14.29	10.71	75.00	3.88	1.073
I look forward to coming to work to do my job	11.90	10.71	77.38	3.84	0.999
I have the capabilities required to do advanced or complex jobs	13.10	7.74	79.17	3.79	0.934
In general, employees in the organisation are eager to develop specialised skills	19.64	16.67	63.69	3.50	1.009
	<u>Aggregate mean score</u>			<u>3.91</u>	

Overall, the average responses to trainee characteristics showed that most of the respondents agreed ($\bar{x} > 3.5$) that they had positive trainee characteristics, which indicated that they were willing and eager to learn from others and to enhance their technical skills and knowledge. The standard deviations also indicated that the responses to this section were consistent. Respondents indicated that they looked forward to coming to work and attending training. What is interesting about these results, is that the last item with a mean of 3.5 indicated that respondents had a lessor belief that other employees were eager to develop specialised skills. This could either indicate a pro-social response and positive self-attribution, or/and that employees do not openly express their desire for personal development. If this was the case, supervisors, team leaders and HR itself might not become aware of the personal development needs of employees. The results tie in with a lack of the identification of skills gap and personal development plans revealed in Table 4.4.

4.4.4 Training design

Table 4.5 provides the distribution of responses, mean and standard deviation per item and they are ranked from highest to lowest mean scores.

Table 4.5: Training Design Item

Training Design	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
Standard operating procedures are emphasised	4.17	8.93	86.90	4.02	0.700
During training, correct and incorrect workplace behaviours are discussed	10.12	10.71	79.17	3.83	0.896
There is on the job training, were experienced employees coach other employees	16.07	11.31	72.62	3.72	0.991
Error management and instruction processes are available to ensure rapid response	12.50	14.29	73.21	3.70	0.872
During training, the facilitator(s) allows us to make mistakes / errors, as a way of learning	20.24	13.10	66.67	3.56	1.031
Training and development needs of the employee are assessed	31.55	12.50	55.95	3.30	1.104
	<u>Aggregate mean score</u>			<u>3.69</u>	

The overall responses for training design were higher ($\bar{x} > 3.6$) with an aggregate mean score of 3.69. Most of the respondents indicated that the training design was good, and they were fairly satisfied the level of training offered by the company during those specific training sessions. Respondents indicated that the organisation enforced the use of standardised work or operating procedures to be adhered to at all times. The last item addressed the assessment and evaluation of employees' development and training needs/requirements. The responses to this item leaned towards neutral and agree, as more employees indicated that their training and development needs were met. HR, managers and supervisors should ensure that the training and development needs of their employees are aligned to their plans to address the skills gap, which is evident in their organisation, largely focused on technical skills.

4.4.5 Work environment

Table 4.5 provides the distribution of responses, mean and standard deviation per item and they are ranked from highest to lowest mean scores. The culture of an

organisation plays a critical role in creating an atmosphere that encourages continuous learning and sharing of ideas, skills, knowledge and best practices.

Table 4.6: Work Environment Item

Work Environment	% Disagree	% Neutral	% Agree	Mean	Std. Dev.
Employees work together as a team to gain the rewards	16.07	13.69	70.24	3.76	1.075
Managers enable employees to go and attend training	16.07	9.52	74.40	3.68	0.998
Colleagues co-operate with each other to achieve standards of excellence irrespective of diverse personal feelings	18.45	10.71	70.83	3.68	1.040
My company recognises good performance and rewards employees	17.26	11.31	71.43	3.67	1.092
When we return from training, my peers and I apply the knowledge that we have learned	16.07	13.10	70.83	3.66	0.996
My effectiveness is a direct consequence of the training I have received	25.00	11.90	63.10	3.49	1.044
When I return from training, I always find opportunities to apply the new skills and knowledge I have learned	22.62	12.50	64.88	3.47	1.077
After training, I get feedback from other employees on how well I am applying what I have learned from training	35.71	17.86	46.43	3.10	1.024
	<u>Aggregate mean score</u>			<u>3.56</u>	

Overall, the aggregate mean score to responses for work environment was 3.5. This indicated that on average the respondents agreed that their work environment was conducive to enable increased technical skills and knowledge transfer. Most respondents agreed that employees worked as a team to gain rewards. Rewards and recognitions practices were in place and employees could apply skills and knowledge learned during training to their daily work. Responses with regard to skills transfer of learning after training were less positive, judging on the mean scores for the last two

items leaning towards neutral scores, albeit on the higher end (closer to agree) of neutral.

In summary, according to the empirical study, four of the independent variables (management of scarce skills, trainee characteristics, training design and work environment) received mostly positive responses. Succession planning is the only independent variable which most of the respondents indicated was lacking in their organisation. The study results suggest that lack of succession planning negatively influenced adequate technical skills and tacit knowledge transfer.

Figure 4.1 shows that the aggregate means scores for management of scarce skills (3.04) and succession planning (3.19) leaned towards neutral. However, the transfer of technical knowledge and skills obtained a mean score of 3.47 which leans towards agreement.

Tables 4.2 and 4.3 show that responses for management of scarce skills and succession planning were spread across the Likert Scale even if the agree option received the most responses. There was disagreement that it was easy to find a replacement easily when a person left and that replacements were sufficiently planned in advance. There seemed to be some disagreement that equal opportunities existed for growth and development, that promotion processes were transparent and that promotion decisions were fair.

Table 4.1 showed that technical skills and knowledge transfer was applied with regards to the immediate jobs of the respondents, but individual skill gap analysis, feedback on performance and a structured training plan were lacking or could be improved upon. The standard deviations in terms of these items were higher, ranging from 1.096 to 1.167. Table 4.3 showed that technical skills and knowledge transfer were mostly applied in departments such as engineering, top-end weld, safety and final assembly, and less in departments such as rod shop, paint shop, finish goods store, cut-off shop and procurement. Respondents believed they demonstrated the required trainee characteristics (Table 4.4), but they had some doubt about the overall eagerness of employees to develop specialised skills.

4.5 INFERENCE STATISTICS

In this section the Pearson correlation test, multiple analysis and multi-collinearity test are discussed.

4.5.1 Pearson Correlation Test

Table 4.7: Pearson Correlation Test (n=168)

Independent Variables	Technical Skills & Knowledge Transfer	Interpretation
Succession planning	0.716	Very strong positive relationship
Work environment	0.679	Strong positive relationship
Management of scarce skills	0.659	Strong positive relationship
Training design	0.608	Strong positive relationship
Trainee characteristics	0.496	Strong positive relationship

The Pearson Correlation Test shows the correlation between each independent variable and the dependent variable, ranked from highest to lowest. The study results indicate a strong positive correlation between technical skills and knowledge transfer and its drivers, with succession planning showing a very strong positive correlation.

The results suggest that if the independent variables increase, the dependent variable will also increase. However, because correlation analysis does not indicate the direction of a relationship, one could reason that if technical skills and knowledge transfer takes place, the characteristics of trainees, management of scarce skills and succession planning, for example, will increase as well. To test influence or the direction of relationship, multiple regression analysis is required.

4.5.2 Multiple Regression Analysis

Table 4.8 indicates the relationship between succession planning and technical skills and knowledge transfer, and between work environment and technical skills and knowledge transfer as statistically significant, with a p-value of < 0.05 . This means that

by implementing succession planning and work environment best practices, technical skills and knowledge transfer could successfully improve. The Beta coefficient suggests that succession planning explains 35.5% of the variance in technical skills and knowledge transfer, and work environment explains 19.6% of the variance in technical skills and knowledge transfer. This implies that succession planning and the work environment need to receive attention for technical knowledge and skills transfer to take place.

Table 4.8: Multiple Regression Analysis on Hypothesised Conceptual Framework (n=168)

	Beta coefficient	Std. Error	B Coefficient	Std. Error	t value	p-value
Intercept			0.654	0.244	2.677	0.008
Management of scarce skills	0.125	0.093	0.120	0.090	1.336	0.183
Succession planning	0.355	0.101	0.307	0.087	3.526	0.001
Trainee characteristics	0.067	0.071	0.075	0.079	0.950	0.344
Training design	0.121	0.084	0.138	0.096	1.438	0.152
Work environment	0.196	0.091	0.189	0.088	2.157	0.032

Note: Significant relationships at $p < 0.05$ are indicated in red

Management of scarce skills, trainee characteristics and training design have positive correlations with technical skills and knowledge transfer that are not statistically significant ($p\text{-value} > 0.05$). This means that implementing principles of the management of scarce skills, trainee characteristics and training design may not significantly improve technical skills and knowledge transfer in this automotive company.

The empirical results show that the five independent variables (i.e. management of scarce skills, succession planning, trainee characteristics, training design and work environment) together explain 57.6% ($r^2 = 0.576$) of the improvement in knowledge transfer. The five independent variables are important determinates of technical skills

and knowledge transfer and succession planning and work environment are significant determinants.

4.5.3 Multi-collinearity Test

The multi-collinearity test presented in Table 4.9 shows the Variance Inflation Factors (VIFs). No correlations between the independent variables and other independent variables are defined by a value of 1. Moderate correlations are described by values between 1 and 5 (succession planning and work environment). Values greater than 5 suggest coefficients are inadequately predicted and represent critical levels of multi-collinearity.

Table 4.9: Multi-collinearity Test (n=168)

Effect	Collinearity statistics - Sigma-restricted parameterisation							
	Tolerance	Variance (Infl fac)	R square	Technical Skills (Beta in)	Technical Skills (Partial)	Technical Skills (Semi-par)	Technical Skills (t)	Technical Skills (p)
Management of scarce skills	0.299	3.340	0.701	0.125	0.104	0.068	1.336	0.183
Succession planning	0.259	3.866	0.741	0.355	0.267	0.180	3.526	0.001
Trainee characteristics	0.522	1.917	0.478	0.067	0.074	0.049	0.950	0.344
Training design	0.371	2.698	0.629	0.121	0.112	0.074	1.438	0.152
Work environment	0.316	3.166	0.684	0.196	0.167	0.110	2.157	0.032

The results do show that succession planning and work environment are related, but not to such an extent that they are considered independent variables in relation to each other. This is shown through VIFs that are less than 5, indicating a moderate relationship only. As such, it can be deduced that both succession planning and the work environment are significant to technical skills and knowledge transfer.

4.6 SUMMARY

Chapter 4 presented the descriptive statistical outcomes of this empirical study and the results were interpreted. The Cronbach's Alpha reliability test attained per variable was good and the measurement instrument used in this study was considered to be reliable. This chapter also presented the descriptive and inferential statistics based on the respondents' perceptions gauged from the questionnaire. In addition, the Pearson correlation test revealed a strong positive correlation between the technical skills and knowledge transfer and its drivers, with succession planning showing a very strong positive correlation. Regression analysis revealed that succession planning and work environment were statistically significant, having positive correlations with technical skills and knowledge transfer ($p\text{-value} < 0.05$). Although in this analysis all of the factors tested contributed to enabling technical skills and knowledge transfer, succession planning followed by work environment have shown the most significant relationship. Succession planning emerged as an even stronger influence of technical skills and knowledge transfer. The following chapter will offer a summarised discussion, highlight the main results, conclusions and recommendations.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Technical Skills and Knowledge Transfer for An Aging Workforce in The Automotive Industry

5.1 INTRODUCTION

The preceding chapter provided the descriptive and inferential statistics intended to answer the research question of this study. The research question was formulated as: Does the management of scarce skills, succession planning, trainee characteristics, trainee design and work environment positively influence technical skills and knowledge transfer in an automotive company? Specific relationships concerning these variables were highlighted with a view to achieving the primary objectives of this study.

In this chapter, the results and model are discussed, including the limitations of the study and recommendations for future research. The aim is to provide recommendations to management and provide an academic contribution, which will improve and influence technical skills and tacit knowledge transfer. In addition, the findings could be used to equip managers and human resource departments on how to structure their succession planning, and store and retain institutional knowledge to remain competitive against their rivals.

5.2 DISCUSSION

This study aimed to add knowledge of critical technical skills and knowledge transfer required in the automotive industry and organisations with high technical tacit knowledge embedded in their experienced employees. Organisations face a dilemma when incumbent tacit knowledge owners vacate employment without transferring invaluable intellectual property to other stakeholders (Khumalo, 2012). Singh and Premarajan (2007) emphasised that when an employee leaves an organisation, all the knowledge that the employee acquired also leaves the organisation.

This study aimed to answer the research question: Does the management of scarce skills, succession planning, trainee characteristics, training design and work environment promote technical skills and knowledge transfer in an automotive company?

The answers are discussed below.

5.2.1 Research Question 1

Does the management of scarce skills positively influence technical skills and knowledge transfer?

The aggregate mean score of the management of scarce skills was 3.04. This indicated that on average, the respondents were neutral about the management of scarce skills in their organisation. More respondents disagreed about the presence of effective training of employees for highly specialised jobs, advance planning and the replacement of experts. More respondents indicated that it was difficult for management to replace experts with internal candidates. These results tend to show that the management of scarce skills as well as the transfer of scarce knowledge and skill were problematic. The empirical results suggested that although respondents felt that sufficient management of scarce skills would increase technical skills and knowledge transfer, their organisation needed to increase their investment and effort in ensuring that talent management practices were prioritised.

5.2.2 Research Question 2

Does succession planning positively influence technical skills and knowledge transfer?

Succession planning yielded the second least average response, with an aggregate mean score of 3.19. This showed that succession planning was not effectively implemented in the organisation. Most employees indicated that they were not adequately trained and equipped for future roles, however they were of the view that individual plans are clear and linked to their development plans.

The results showed that succession planning had a strong correlation and influence on technical skills and knowledge transfer in an automotive environment. This means that management and human resources must focus their efforts in ensuring that good succession planning principles are practiced at all levels of the organisation, or especially by experienced employees with years of tacit, embedded knowledge.

5.2.3 Research Question 3

Do trainee characteristics positively influence technical skills and knowledge transfer?

Trainee characteristics as a determinant of effective technical skills and knowledge transfer yielded the highest response rate with an aggregate mean score of 3.91 of respondents agreeing with the presence of positive trainee characteristics. This means that most of the employees were willing and eager to learn from others to enhance their technical skills and knowledge.

5.2.4 Research Question 4

Does training design positively influence technical skills and knowledge transfer?

The results of the empirical study showed that most of the respondents felt that training design was important to achieve effective knowledge transfer. Training design received the second highest response rate, with 3.69 of respondents suggesting that training design would increase technical skills and knowledge transfer. Most of the respondents indicated that they were satisfied with the level of training offered by the organisation, and they looked forward to attending training and applying what they learned in training in their work situation. Respondents further indicated that during training, the facilitator allowed them to make mistakes or errors as a way of learning.

5.2.5 Research Question 5

Does work environment positively influence technical skills and knowledge transfer?

Overall, the average response to work environment was 3.5. This means that on average, the respondents believed that work environment as a determinant of knowledge transfer existed in their organisation. Most respondents indicated that rewards and recognition incentives and practices were in place. They further suggested that teamwork existed and was evident in their performance.

The results showed that work environment had a strong correlation and influence on technical skills and knowledge transfer in this automotive company. Sixty-four percent of the respondents indicated they always found opportunities at work to apply what they learned at training.

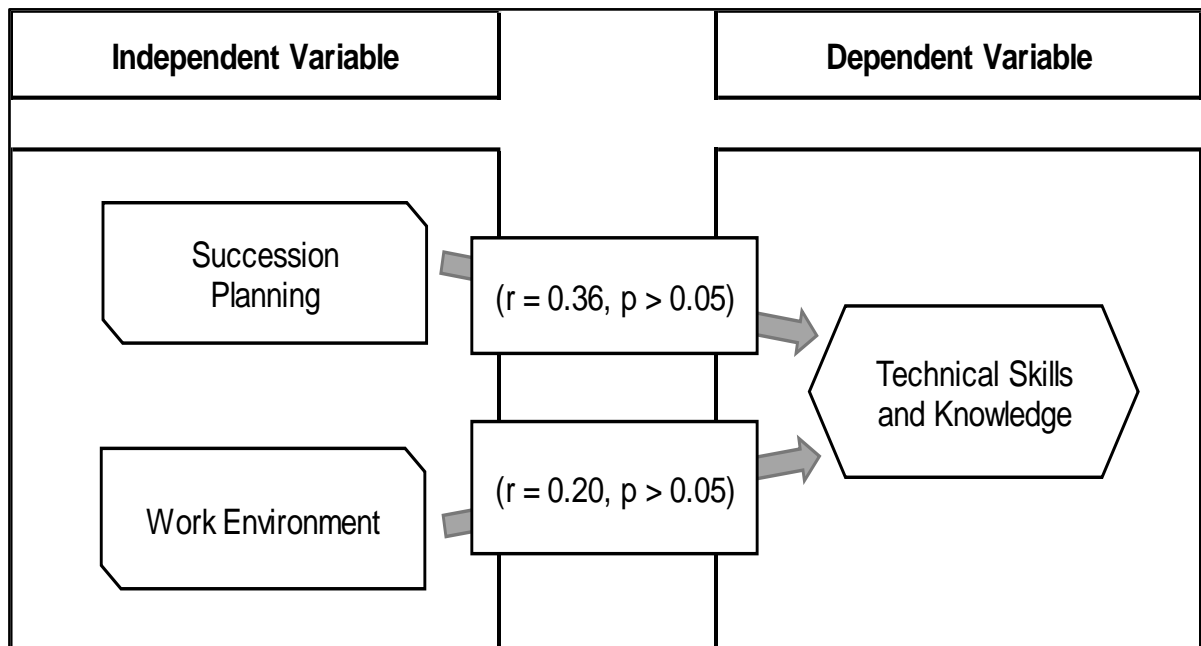
5.2.6 Regression and Correlation Analysis

The Pearson correlation test per variable presented in chapter 4, indicated a strong positive correlation between technical skills and knowledge transfer and its drivers. Succession planning showed a very strong positive correlation of 0.716. The results suggested that the independent variable had a positive influence on the dependent variable.

The regression analysis indicated that succession planning (35.5%) and work environment (19.6%), both with p-values of greater than 0.05, were statistically significant having positive correlations with technical skills and knowledge transfer. This meant that implementing good succession planning and work environment best practices, technical skills and knowledge transfer would improve in an automotive environment. The other independent variables (management of scarce skills, trainee characteristics and training design), all had positive correlations with technical skills and knowledge transfer; however, they were not statistically significant with p-values of less than 0.05. The study indicated that all of the independent variables combined explained 57.6% ($r^2 = 0.576$) of the improvement in knowledge transfer.

5.3 ACCEPTANCE OR REJECTION OF THE HYPOTHESES

Figure 5.1: Technical Skills and Knowledge Transfer Model



The five hypotheses were formulated in chapter 1. The empirical findings of the study provided justification whether these hypotheses are supported or not. Figure 5.1 indicates the significant key drivers of technical skills and knowledge transfer variables in an automotive environment. The acceptance and rejection of the hypotheses are presented below:

H₁: Management of scarce skills positively influences technical skills and knowledge transfer in an automotive environment.

The results show that management of scarce skills is not a significant determinate of technical skills and knowledge transfer. The first hypothesis is not supported.

H₂: Succession planning positively influences technical skills and knowledge transfer in an automotive environment.

The results indicate that succession planning is a significant determinant of technical skills and knowledge transfer. The second hypothesis is therefore supported.

H₃: Trainee characteristics positively influence technical skills and knowledge transfer in an automotive environment.

The empirical results show that Trainee characteristics is not a significant determinant of technical skills and knowledge transfer. The third hypothesis is rejected.

H₄: Training design positively influences technical skills and knowledge transfer in an automotive environment.

The results show that training design is not a significant determinant of technical skills and knowledge transfer. The fourth hypothesis is therefore not supported.

H₅: Work environment positively influences technical skills and knowledge transfer in an automotive environment.

The results suggest that the respondents acknowledged the importance of work environment, meaning that work environment is a significant determinant of technical skills and knowledge transfer. The fifth hypothesis is therefore supported.

5.4 RECOMMENDATIONS

In this section the recommendations to management, trainees, mentors and human resources are discussed. This study highlighted two critical drivers or enablers of technical skills and knowledge transfer, being succession planning and the work environment. The main benefit of effective succession planning implementation is knowledge retention (Ejakpomewhe, 2017).

5.4.1 Recommendations to management

According to Bansal (2014), the key objective of retention is to prevent organisations from losing their most competent employees and institutional knowledge, which affect service delivery and productivity. When organisations retain competent employees and develop a system for storing tacit knowledge, loss of knowledge can be avoided.

It is evident that succession planning is the main critical driver of technical skills and knowledge transfer. Firstly, management should start by identifying key critical functions, roles and scarce skills to address this issue. Secondly, they should rank the

roles based on severity and identify experienced employees who are experts in these skills or roles. Tenure and years remaining before retirement should be used to decide which roles should be prioritised. Thirdly, clear objectives and development goals must be developed once the trainees have been identified. Trainees should be identified and mainly recruited from within the organisation, where possible, as this will assist in speeding up the learning curve. Lastly, management should conduct regular reviews and check-in sessions with both the trainee and mentor.

5.4.2 Recommendations to the organisation and the Human Resource Department

According to Rothwell (2011), the retirement of the workforce and the shortage of technically experienced employees present a substantial challenge to senior leaders, should they decide to not take immediate counter measures to prepare for the upcoming generation of employees and leaders. Several empirical studies have explored the problems of talent management and succession planning, however organisational leaders have failed to focus on developing a durable pool of talented individuals at a junior or lower level. Special emphasis should be placed on succession planning best practices. Every organisation has a human resource strategy that includes talent management, succession planning and knowledge retention. Succession planning must be at the core of the human resource strategy and must be practiced at all levels of the organisation. Training needs, which includes the mentor's ability to facilitate training and transfer their tacit and explicit knowledge, should be evaluated and assessed by internal or external assessors. All mentors should be sent for facilitation, mentoring, coaching and presentation skills training or workshops. This will ensure that experienced employees who are selected as mentors possess the necessary skills to adequately transfer their knowledge to trainees or mentees.

5.4.3 Recommendations to trainee and mentor

Work environment includes a compelling transfer climate, support, opportunity to perform and follow-ups. According to Salas et al. (2006), the effectiveness of training is largely dependent on the ability of the employees to practice their newly acquired skills and competencies on the job. Management should create an environment where

employees are encouraged to explore and make mistakes. A good relationship between the trainee and mentor is one of the key enablers of effective knowledge transfer. A cohesive relationship between the trainee and the mentor must be established and management must ensure that the work environment is conducive to knowledge transfer and learning. All selected mentors must give consent to the organisation on their willingness and interest in training others. Mentors should be paired with trainees with whom they are willing to work. Mentors should be offered an opportunity to select their own mentees from a pool of identified employees in the organisation. A minimum of three years is a fair duration for training transfer to take place. Thus, management should give mentors and mentees at least five years for skills and knowledge transfer to take place.

5.4.4 General recommendations

The results from the empirical study highlighted that the organisation definitely focuses on good performance, but less so in terms of personal development and knowledge and skills transfer at a deeper level. This implies that having a structured plan for knowledge and skills transfer, a development plan, review on performance, feedback on performance and employees allowed opportunities to experiment with new skills, will enable the organisation to increase technical skills and knowledge transfer at all levels. The results further indicated a lack of succession planning and most respondents were dissatisfied with transparency and fairness around succession planning. The human resource department, together with managers should be responsible for succession planning. Current positions should be audited by line managers and HR business partners to examine skills, years of service, years remaining to retirement, skills required for future positions, identifications for potential employees, development plan and skills gap. Employees also need to understand what is expected, so that they actively develop themselves through seeking out mentors, self-study and demonstrating volunteerism in the organisation.

5.5 LIMITATIONS OF THE STUDY

The key limitation of this study would be the stringent timeframes available for treatise completion. Other possible limitations to the study include the following:

- The nature of the study being convenience sampling as a non-probability sampling method, which does not provide all respondents with an equal opportunity of being chosen as in random sampling. This could create a form of bias, however since the sample size was 168 respondents, the results can be read with confidence.
- Even though the sample size was greater than 150 respondents, it was restricted to a single automotive manufacturing site in Port Elizabeth, South Africa. However, the literature review demonstrated that the issue of technical skills and knowledge transfer is a widespread issue, especially in the manufacturing environment.
- The interpretation and understanding of the questionnaire statements is subject to evaluation, as the demographics indicated that the majority of respondents had a matric or lower than high school qualification. The questionnaire was not available in other local languages, however the official language of communication in the organisation is English.

5.6 FUTURE RESEARCH

This study presents opportunities for future in the following areas:

- Further research focused on evaluating key factors of successful succession planning practices in an automotive environment to increase knowledge transfer.
- Good mentorship programs aimed at improving bench strength can be explored further.
- Incentives for encouraging knowledge sharing best practices as a form of reward and recognition should be in place.

5.7 CONCLUSION

This study aimed to investigate the importance of technical skills and knowledge transfer in an automotive industry. The proposed drivers of technical skills and knowledge transfer investigated were management of scarce skills, succession

planning, trainee characteristics, training design and work environment. Although, in the study all of the factors tested contributed to enabling technical skills and knowledge transfer, succession planning showed the most significant relationship. Succession planning emerged as a strong influence of technical skills and knowledge transfer in an automotive organisation. Management should consider implementing structured succession planning focused at scarce and critical technical skills and knowledge. Identification and training of experienced employees to become effective mentors should be at the core of knowledge transfer and retention within an automotive organisation.

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APPENDIX 1: ETHICS CLEARANCE



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6001, South Africa | mandela.ac.za

Chairperson: Faculty Research Ethics Committee (Human)
Tel: +27 (0)41 504 2906

Ref: [H20-BES-BUS-057] / Approval]

26 June 2020

Prof A Werner
Department: Graduate School

Dear Prof Werner,

TITLE OF STUDY: TECHNICAL SKILLS AND KNOWLEDGE TRANSFER FOR AN AGING WORKFORCE IN AN AUTOMOTIVE COMPANY (MBA)

PRP: Prof A Werner
PI: G Mahlalela

Your above-entitled application served at the *Faculty Ethics Committee of the Faculty of Business and Economic Science, (8 May 2020)* for approval. The study is classified as a negligible/low risk study. The ethics clearance reference number is H20-BES-BUS-057 and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Lindie@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 to be made available shortly on Research Ethics Committee (Human) portal) by 15 December this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 December next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 to be made available shortly on Research Ethics Committee (Human) portal).
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 to be made available shortly on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 to be made available shortly on Research Ethics Committee (Human) portal) upon unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Lindie@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely

A handwritten signature in black ink, appearing to read 'S Mago', followed by the printed name 'Prof S Mago'.

Cc: Department of Research Capacity Development
Faculty Research Co-ordinator: Lindie van Rensburg

APPENDIX 2: THE COVER LETTER OF THE QUESTIONNAIRE



FACULTY OF BUSINESS AND ECONOMIC SCIENCES

Dear Respondent

I am studying towards my MBA (Master of Business Administration) degree at the Nelson Mandela University Business School. I am conducting research on Technical skills and knowledge transfer in the automotive industry. I am of the belief that my study will make a positive contribution in improving technical skills and knowledge transfer in this automotive company.

You are part of our selected sample of respondents whose views we seek on the above matter. The questionnaire should not take you more than 10 minutes to complete and we thank you in advance for your participation. There are no correct or incorrect answers. Please answer the questions as accurately as possible. Please tick to select the best number that describes your experience or perception, to answer each statement.

Kindly note that your participation in this study is entirely voluntary and that you have the right to withdraw from the study at any stage. We also guarantee your anonymity and the confidentiality of information acquired by this questionnaire. Your name and the name of your firm will not be mentioned in this study.

Thank you.

Gaven Mahlalela

082 316 8976

gavenpro@gmail.com

To verify the authenticity of this study, kindly contact Professor Amanda Werner on office telephone number 041 504 3749 or email address: Amanda.werner@mandela.ac.za.

APPENDIX 3: QUESTIONNAIRE

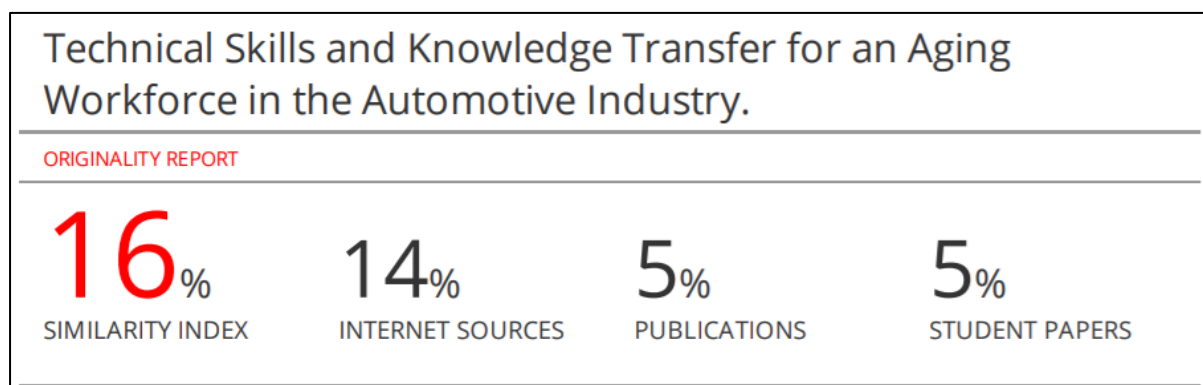
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SECTION 2						
For each statement, tick the box which best describes your experience or perception in terms of the firm you are employed in.						
2,0	Management of Scarce skills at Tenneco/Driv	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2,01	Replacements of experienced employees with scarce skills are planned sufficiently in advance.					
2,02	My company effectively identifies employees with special skills and talents.					
2,03	My company effectively develops and nurture employees' skills and talents.					
2,04	My company is effective in training employees in highly specialised jobs.					
2,05	The right people are recruited, and effort is made to help them develop their skills.					
2,06	When a highly skilled person resigns, performance and efficiency is maintained.					
2,07	When a highly skilled person leaves, it is easy to find a replacement internally.					
2,08	An internal pool of experts is ready to fulfil the requirements of highly specialised jobs.					
2,09	When a problem is outside the team's scope, a few experts/specialists are readily available to assist.					
2,10	When people retire, problems related to machines, equipment and processes are simply solved by junior employees.					
2,11	My company effectively fosters a high-performance work culture to retain talented employees.					
SECTION 3						
For each statement, tick the box which best describes your experience or perception in terms of the firm you are employed in.						
3,0	Succession planning at Tenneco/Driv	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3,01	In my company employees have equal opportunities for growth and development.					
3,02	Employees are developed and trained adequately for future role(s).					
3,03	Employees have opportunities to work comfortably with senior / experienced employees.					
3,04	Promotion decisions are fair.					
3,05	Promotion processes are transparent.					
3,06	My Personal Development Plan (PDP) is clear.					
3,07	My Personal Development Plan (PDP) is linked to my career path.					
3,08	My Personal Development Plan (PDP) makes provision for external training modules and courses to support my career path.					
3,09	My line manager knows my skills gaps reviews my progress on regular basis.					
3,10	My manager manages employees with a view of preparing them for future succession.					

SECTION 4						
For each statement, tick the box which best describes your experience or perception in terms of the firm you are employed in.						
4,0	Trainee characteristics at Tenneco/Driv	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
4,01	I look forward to coming to work to do my job.					
4,02	I look forward to learning new skills during training and applying them at my job.					
4,03	I eagerly learn from others whenever I can.					
4,04	I willingly invest effort in my work. I persist in my work even in the face of difficulties.					
4,05	In general, employees in the organisation are eager to develop specialised skills.					
4,06	I have the capabilities required to do advanced or complex jobs.					
4,07	My work behaviour shows that I believe that every employee is responsible for his/her area of work.					
4,08	I see myself being able to perform highly specialised jobs in the near future, if given a chance.					
SECTION 5						
For each statement, tick the box which best describes your experience or perception in terms of the firm you are employed in.						
5,0	Training design at Tenneco/Driv	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5,01	Training and development needs of the employee are assessed.					
5,02	During training, the facilitator(s) allows us to make mistakes / errors, as a way of learning.					
5,03	Error management and instruction processes are available to ensure rapid response.					
5,04	During training, correct and incorrect workplace behaviours are discussed.					
5,05	Standard operating procedures are emphasised.					
5,06	There is on the job training, where experienced employees coach other employees.					

6,0	Work environment at Tenneco/Driv	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6,01	My effectiveness is a direct consequence of the training I have received.					
6,02	When we return from training, my peers and I apply the knowledge that we have learned.					
6,03	When I return from training, I always find opportunities to apply the new skills and knowledge I have learned.					
6,04	Managers enable employees to go and attend training.					
6,05	Colleagues co-operate with each other to achieve standards of excellence irrespective of diverse personal feelings.					
6,06	Employees work together as a team to gain the rewards.					
6,07	My company recognises good performance and rewards employees.					
6,08	After training, I get feedback from other employees on how well I am applying what I have learned from training.					
SECTION 7						
For each statement, tick the box which best describes your experience or perception in terms of the firm you are employed in.						
7,0	Technical Skills and Knowledge transfer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7,01	My manager provides the necessary support I need to perform my duties as expected.					
7,02	My manager provides feedback on my performance.					
7,03	Experienced employees at my company have a structured and well documented Training Plan to train new or junior employees.					
7,04	Employees are equipped with tools, skills and knowledge on how to handle potential errors / failures.					
7,05	I am willing to be coached/trained by my seniors or experienced employees.					
7,06	Employees are encouraged to explore and make mistakes.					
7,07	My line manager knows my skills gaps.					

APPENDIX 4: TURN-IT-IN ORIGINALITY REPORT



My Submissions				
Part 1				
Title	Start Date	Due Date	Post Date	Marks Available
MBA Treatise Submission - Part 1	2 Jan 2021 - 13:12	31 Dec 2022 - 13:12	1 Dec 2022 - 13:12	100
Refresh Submissions				
Submission Title	Turnitin Paper ID	Submitted	Similarity	Grade
View Digital Receipt Technical Skills and Knowledge Transfer for an Aging Workforce in the Automotive Industry.	1716701909	9/12/21, 23:18	16% <div></div>	N/A
Submit Paper Download				

APPENDIX 5: PERMISSION TO SUBMIT TREATISE FORM



PERMISSION TO SUBMIT FINAL COPIES OF TREATISE/DISSERTATION/THESIS TO THE EXAMINATION OFFICE

Please type or complete in black ink

FACULTY: FACULTY OF BUSINESS AND ECONOMIC SCIENCES

SCHOOL/DEPARTMENT: BUSINESS SCHOOL

I, (surname and initials of supervisor) WERNER, A

and (surname and initials of co-supervisor) VELDKORNET, O and MAVUSO, M

the supervisor and co-supervisor respectively for (surname and initials of
candidate) MAHLALELA, G

(student number) 212434519 a candidate for the (full description of qualification)

MASTER'S IN BUSINESS ADMINISTRATION (MBA)

with a treatise/dissertation/thesis entitled (full title of treatise/dissertation/thesis):

TECHNICAL SKILLS AND KNOWLEDGE TRANSFER FOR AN AGING WORKFORCE IN THE AUTOMOTIVE

INDUSTRY

It is hereby certified that the proposed amendments to the treatise/dissertation/thesis have been effected and that permission is granted to the candidate to submit the final bound copies of his/her treatise/dissertation/thesis to the examination office.

A. Werner

SUPERVISOR

DATE

07/03/2022

And

Ophelia Veldkornet

07/03/2022

CO-SUPERVISOR

DATE

And

Mandisa Mavuso

08/03/2022

CO-SUPERVISOR

DATE