

RESEARCH DISSERTATION

**DISTRACTED GENERATION (?): TECHNOLOGY USE,
TEXTING AND DRIVING IN SOUTH AFRICA.**

by

KGASAGO TSHEPHO JUSTICE

DISSERTATION

Submitted in fulfilment of the requirement for the degree of

MASTER OF ARTS

in

COMMUNICATION STUDIES

in the

FACULTY OF HUMANITIES

(School of Languages and Communication Studies)

at the

UNIVERSITY OF LIMPOPO

2017

SUPERVISOR: Prof. T. Oyedemi

DECLARATION**Kgasago Tshepho Justice**

I declare that **DISTRACTED GENERATION (?) TECHNOLOGY USE, TEXTING AND DRIVING IN SOUTH AFRICA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

SIGNED

DATE

DEDICATION

This work is dedicated to my family.

ACKNOWLEDGEMENTS

I would like to thank the Department of Media, Information and Communication Studies for giving me the opportunity to do this research. I have nothing but special gratitude for my supervisor, Prof. Oyedemi, for enormous support and encouragement. His guidance and knowledge was my strength to finish my study.

To my family, thank you very much for believing in me, I am truly grateful for the love and support. You are pillar of my strength to achieve more and I am thankful for everything.

To my friends and colleagues, your friendship, support, love and encouragement keeps me going and I am truly grateful.

ABSTRACT

The use of communication technologies has brought changes to our daily ways of doing things. Youth use technology for different purposes at different locations. As technology grows everyday with various advantages, its benefits come along with some disadvantages. Road accidents are one of the major problems that South Africa experiences. The focus of this study was to explore the danger of texting and driving and its potentials for road accidents. This research focused on the negative impact of technology, mainly technological distraction, while driving.

Broadly, this research looks at the social and cultural impact of texting and mobility, with specific focus on distracted driving. This study is significant in the social analysis of technology use and distraction; this significance is made more important considering that there is very limited study of this social issue in South Africa. The always-available communication culture (such as texting while driving) should be viewed as a problematic phenomenal.

For data collection, the researcher conducted a survey with adults and youth drivers to explore the perceptions and attitudes of drivers towards cell phone use, texting and driving. The researcher also conducted roadside observations of drivers to investigate the occurrence of distracted driving due to technology use, and interviews were conducted with Traffic Officers to share their professional experience on observing incidences of texting and driving.

The study reveals that technology use, texting and driving is a common problem among young drivers, while adults tend to be more careful and engage less in this activity. Aspect of the findings of the study shows that 60% of drivers report that they have sent a text while driving. Moreover, the study explores ways of curbing cell phone use, texting and driving on South African roads. There should be more research on distracted driving and technology use, so that more suggestions on how to curb technology use while driving can be offered.

KEYWORDS

Technological distraction, distracted driving, texting and driving, always-available communication culture, road accidents, and technological determinism

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
KEYWORDS.....	iv
LIST OF FIGURES.....	ix
LIST OF TABLES.....	x
LIST OF ABBREVIATIONS	xi
CHAPTER 1: BACKGROUND OF THE STUDY	1
1.1 INTRODUCTION	1
1.2 RESEARCH PROBLEM	6
1.3 LITERATURE REVIEW AND THEORETICAL FRAMEWORK	7
1.3.1 Literature Review.....	7
1.3.1.1 Texting and mobility: always available communication culture.....	7
1.3.1.2 Technological distraction	8
1.3.1.3 Distracted driving	8
1.3.2 THEORETICAL FRAMEWORK	10
1.3.2.1 Technological determinism and unintended consequences of technology	10
1.4 PURPOSE OF THE STUDY	12
1.4.1 Aim of the study	12
1.4. Objectives of the study	12
1.5 RESEARCH METHODOLOGY	13
1.6 Research Design	13
1.7 SAMPLING	14
1.7.1 Quantitative methodology sampling (Survey)	14
1.7.2 Qualitative methodology sampling (Interviews and observation)	14
1.8 DATA COLLECTION METHODS.....	14
1.8.1 Quantitative data collection instruments	14
1.8.1.1 Survey.....	14
1.8.2 Qualitative data collection instruments.....	15
1.8.2.1. Interviews	15

1.8.2.2 Observation.....	15
1.9 DATA ANALYSIS.....	15
1.9.1 Quantitative data analysis	16
1.9.1.1 Questionnaires	16
1.9.1.2 Observation.....	16
1.9.2 Qualitative data analysis	16
1.9.2.1 Interviews	16
1.9.2.2 Observation.....	17
1.10 RELIABILITY, VALIDITY AND OBJECTIVITY.....	17
1.10 BIAS	18
1.11 ETHICAL CONSIDERATIONS.....	18
1.12 SIGNIFICANCE OF THE STUDY	19
1.13 RESEARCH STRUCTURE	19
CHAPTER 2:TECHNOLOGY AND MOBILITY: THE ALWAYS AVAILABLE COMMUNICATION CULTURE.....	21
2.1 INTRODUCTION	21
2.2 ALWAYS-AVAILABLE COMMUNICATION CULTURE.....	21
2.2.1 The impact of convergence on the always-available culture.....	23
2.2.2 Always-available communication culture -The end of solitude and implication for privacy	25
2.2.3 Always-available communication culture and the implication for language	26
2.3 THE SOCIAL AND CULTURAL IMPLICATIONS OF 'ALWAYS-AVAILABLE CULTURE': CONSEQUENCES OF TECHNOLOGY, CYBERCRIME AND CYBER BULLYING.....	28
2.4 TECHNOLOGY AND SOCIAL RELATIONS.....	30
CHAPTER 3:TECHNOLOGICAL DISTRACTION	35
3.1 INTRODUCTION	35
3.2 TECHNOLOGY ADDICTION	35
3.3 TECHNOLOGICAL DISTRACTION IN CLASSROOM AND WORKPLACE	38
3.4 TECHNOLOGY USE, PEDESTRIAN DISTRACTION AND ROAD SAFETY	41
3.5 DISTRACTED DRIVING AND TECHNOLOGY USE	44
3.5.1 Legislation and Distracted Driving	48
3.6 CONCLUSION	51
CHAPTER 4:THEORETICAL FRAMEWORK:TECHNOLOGICAL DETERMINISM AND UNINTENDED CONSEQUENCES OF TECHNOLOGY	52

4.1 INTRODUCTION	52
4.2 TECHNOLOGICAL DETERMINISM.....	52
4.2.1 Types of technological determinism.....	54
4.2.1.1 Utopianism	54
4.2.1.2 Dystopianism	56
4.3 Unintended consequences of technology.....	58
4.3.2 Technological innovation and change process.....	60
CHAPTER 5: RESEARCH METHODOLOGY	62
5.1 INTRODUCTION	62
5.2 RESEARCH DESIGN	62
5.3 SAMPLING	63
5.3.1 Quantitative methodology sampling (Survey)	63
5.3.2 Qualitative methodology sampling.....	64
5.3.2.1 Interviews	64
5.3.2.2 Observation.....	65
5.4 DATA COLLECTION METHODS.....	65
5.4.1 Quantitative data collection instruments.....	65
5.4.1.1 Survey.....	65
5.4.2 Qualitative data collection instruments	66
5.4.2.1 Interviews	66
5.4.2.2 Observation.....	67
5.5 DATA ANALYSIS.....	68
5.5.1 Quantitative data analysis	68
5.5.1.1 Questionnaires	68
5.5.1.2 Observation.....	69
5.5.2 Qualitative data analysis	69
5.5.2.1 Interviews	69
5.5.2.2 Observation.....	69
5.6 RELIABILITY, VALIDITY AND OBJECTIVITY	70
5.7 CONCLUSION	71
CHAPTER 6: PREVALENCE OF TECHNOLOGY USE, TEXTING AND DRIVING (DATA ANALYSIS & PRESENTATION).....	72
6.1 INTRODUCTION	72

6.2 TEXTING AND DISTRACTED DRIVING (VISUAL DISTRACTION).....	73
6.3 BIOMECHANICAL DISTRACTIONS (PHONE CALL AND DISTRACTED DRIVING AND TUNING RADIO).....	78
6.4 COGNITIVE DISTRACTION.....	80
6.5 AUDITORY DISTRACTION	81
6.6 ALWAYS-AVAILABLE COMMUNICATION CULTURE AND DISTRACTION	83
6.7 CONCLUSION	85
CHAPTER 7: THE IMPACT OF TECHNOLOGY USE, TEXTING AND DISTRACTED DRIVING (DATA ANALYSIS & PRESENTATION).....	86
7.1 INTRODUCTION	86
7.2 THE IMPACT OF TECHNOLOGY USE, TEXTING AND DISTRACTED DRIVING WHILE DRIVING.....	88
7.3 AWARENESS OF THE DANGER OF TECHNOLOGICAL DISTRACTION AND DRIVING .93	
7.4 CONCLUSION	96
CHAPTER 8: CONCLUSION AND RECOMMENDATIONS.....	97
8.1 INTRODUCTION	97
8.2 RESEARCH DESIGN AND METHODS.....	97
8.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS.....	98
8.4 CONCLUSION	102
8.5 RECOMMENDATIONS	102
8.5.1 Recommendation from previous studies	102
8.5.2 Recommendations from data collected in this study.	105
8.5.3 Discussion of recommendations and researcher's view	107
8.6 CONTRIBUTIONS OF THE STUDY	107
8.7 LIMITATIONS OF THE STUDY	108
8.7 CONCLUDING REMARKS	109
REFERENCE LIST	110
APPENDIX 1: QUESTIONNAIRE.....	124
APPENDIX 2: OBSERVATION GUIDE	131
APPENDIX 3: INTERVIEW GUIDE	133
APPENDIX 4: INTERVIEW RESPONSES.....	134

LIST OF FIGURES

	PAGE
Figure 3.1: Texting zone signage	50
Figure 3.2: Texting zone signage	50
Figure 4.1: Two views of technological innovation	55
Figure 6.1: Drivers that receive and read messages while driving	74
Figure 6.2: Self confidence in texting and driving by gender	76
Figure 6.3: Texting and driving and years of driving experience	77
Figure 6.4: Driving with loud music according to gender (In frequency)	82
Figure 6.5: Driving with Loud Music	83
Figure 6.6: Texting while walking in ages	84
Figure 7.1: Arrive Alive banner for curbing texting while driving	88
Figure 7.2: Ages of drivers who nearly had accident due to texting while driving	89
Figure 7.3: Gender of drivers who nearly had an accident because of texting while driving	89
Figure 7.4: Awareness of danger of technological distraction and driving	94
Figure 7.5: Knowledge of illegality of texting and driving based on education level (In Frequencies)	95

LIST OF TABLES

	PAGE
Table 5.1: Demographics of the drivers	64
Table 5.2: The demographics of the drivers that were observed	65
Table 6.1: Phone call with hand-held cell phone while driving	78

LIST OF ABBREVIATIONS

AA - Automobile Association of South Africa

FARS - Fatality Analysis Reporting System

GHSA - Governors Highway Safety Association

HPI - Health Practice Index

ICT - Information and Communication Technologies

NHTSA - National Highway Traffic Safety Administration

RoSPA – The Royal Society for the Prevention of Accidents

RTMC – Road Traffic Management Corporation

UK – United Kingdom

SA – Situation Awareness

SHSOs -State Highway Safety Offices

USA – United State of America

CHAPTER 1

BACKGROUND OF THE STUDY

1.1 INTRODUCTION

Texting has become one of the most regular activities in communication (Haste, 2005). The study shows that nine out of ten drivers (89%) are doing so at least once a day, and 54% five times a day or more. Hence, mobile cell phones have become important tools in our lives and which we use to communicate with different people from all over the world. Due to the rapid growth in the number of texting applications, most people use this method to transmit their message. Texting is the cheapest method of technological communication which is why is preferred by many. A study conducted by Effective Measure (2014) shows that South African Mobile Report in August 2014 reflected that social media is the third most popular activity on smart phones after instant messaging and email. A Study by Zickuhr (2011) shows that 85% of Americans aged eighteen and older own mobile cell phones, making it the most popular device among adults.

The use of technology has brought changes to our normal way of doing things. Youth use technology for different purposes at different locations (Rosenbaum, 2013). They may use technology to communicate, to listen to music, watch movies, find information on the internet, or to make purchases online. These technological advances lead to distraction in our lives. The internet will always have something interesting which will distract a person from doing something that can be productive. There are many sites, games, social networks and much content that is updated frequently. All these technological entertainments are addictive and hard to quit. People isolate themselves from their friends and family because of technology, hence technologies distract our social relationships (Rosenbaum, 2013).

Technology causes distraction everywhere, one being in the classroom. Students may find themselves not concentrating but focusing on their mobile phones during class attendance. Some answer calls, browse the internet or take pictures or text.

If students do not learn how to be focused and shut out distractions, research demonstrates that they will have a much harder time excelling in almost every area (Schwartz, 2013). This means that technology leads to divided attention in the classroom and this could lead to failure. Different institutions provide wireless connections which provide student with easy access to the internet. In this regard, attention is a major challenge for students, meaning that they are unable to finish their school work due to technological distractions. The ability to stay focused without being distracted is a key to achievement.

Youth, adults and technology in the current digital era are inseparable. Zickuhr (2011) states that a majority of youth use their mobile cell phones to take pictures, text, browse on the internet, send and receive emails, play games, listen to music and record videos. They take their mobile phones everywhere they go. As a result, this leads to texting mobility and new a form of communication. Furthermore, youth text everywhere they go; in churches, school, meetings and work, to mention just a few. Zickuhr (2011) supports this by stating that youth are leading the way in increased mobility. This means that they prefer laptops rather than desktops and use their mobile cell phones for various activities such as internet, email, video, games and music. This phenomenon of texting and mobility has brought advantages to communication, meaning that people easily transmit messages everywhere from their convenient location. However, the issue of texting and mobility could cause distraction which could lead to unpleasant circumstances. These include being unable to finish or pay full attention to a task.

Texting requires full attention which means keeping eyes off the road, thus anything could happen when a person is not looking at road. Browsing the internet for any purpose is also dangerous because it also requires time, therefore, attention will be divided. Carroll (2014) shows that two in five teenagers say that they have been nearly hit or have been hit, by car because of texting and walking. This means that 40% of teens have been struck or nearly struck by a car or motorbike while texting. Hence texting and walking should be considered as a growing epidemic since there is an increased rate of technological penetration.

Texting is the technological method of communication which people use in most cases. This texting culture results in an unexpected outcome which is language change (Goggin, 2004). This means that technology could cause confusion between formal and informal writing. Buchnan, Friedrich and Purcell (2013) show that 46% of digital tools make students to write faster and more carelessly. Moreover, 40% of teachers say that digital technologies make student more likely to use poor spelling and grammar in their academic writing. Most youth shorten words which they type while texting. This epidemic is called ‘penmanship for illiterates’ (McWhorter, 2013).

People get distracted by different things while they are driving. Distracted driving means activities such as talking to a passenger; selecting a song from the car tape, talking on a cell phone or texting, checking oneself in the mirror or eating while driving. In the United State of America (USA), the study by the National Highway Traffic Safety Administration (NHTSA) in 2013 showed that in 2011, 3,331 people were killed and 387,000 people were injured because of distracted drivers. Drivers under the age of twenty form a large proportion of distracted drivers and account for 11% of fatal car crashes. An estimated 9% of all persons who drive during the day do so while they are calling or talking on a cell phone or texting (Dingus, Guo, Klauer, Lee, Ouimet and Simons-Morton, 2014). Any activity in which a driver could engage while driving could be considered as distracted driving. An inspection of crash data reveals that any distraction has the potential to cause or contribute to an accident (Ranney, Garrott and Goodman, 2001). Ranney et al (2001) show such distraction in terms of four distinct categories:

- Visual distraction (e.g. looking away from the roadway)
- Auditory distraction (e.g. responding to a ringing cell phone)
- Biomechanical distraction (e.g. manually adjusting the radio volume)
- Cognitive distraction (e.g. being lost in thought)

A distraction may also be caused by one or two of these categories combined.

People use mobile phones for different purposes, primarily for communication. The study of Haste (2005), focusing on how youth use their mobile cell phones, found that predictive text messaging is slightly less prevalent, with 30% doing so five times per day

or more, and 53% at least daily. Haste (2005) projects that three-quarters of youth speak to friends at least daily and 16% do so five times a day or more. It was also revealed showing that males are more likely (84%) than females (67%) to talk to their friends daily. Moreover, about 53 % of youth use their mobile cell phones to speak to their parents at least daily. In addition, the study by Haste (2005) ascertained that 27% of youth say they text only their friends and never their parents, however only 5% say that they talk only to their friends and never their parents

Fundamentally, people use their mobile phones to maintain their social life. In this era, mobile cell phones have different applications and features which people also use to entertain themselves. People may use their mobile phones to take pictures, videos or to listen to music. Different applications provide youth with different applications that they may use. Some may download games, music productions or informational applications such as news updates.

Road accidents are one of the major problems that South Africa has. There have been different campaigns created to reduce this challenge. The Arrive Alive Road Safety Campaign was launched in 1997 by the Department of Transport with the purpose of reducing the carnage on South African roads. This campaign formed part of R53 million nation campaigns and involved spending an additional 250,000 man-hours on the roads, in mobile courts, on daily roadblocks, on patrols and in administrative offices (Arrive Alive, 2015). In 1998 the Arrive Alive campaign identified driver fatigue as important factor over the Easter holiday period when people travel short and long distances.

A company called Discovery Insure in South Africa has developed a mobile application that can pick up and measure driving behaviour. Their application discovered that drivers spend 52 seconds using their phone while driving. At 60 kilometres per hour, this is equivalent to driving 'blind' for one kilometre, and research shows that using one's phone makes one four times more likely to have an accident (Discovery Insure, 2015). Consequently, drivers could find themselves being distracted and driving outside the road dividing line.

However, the increase in cell phones usage to text leads to high volumes of distraction for different activities (Stimpson and Wilson, 2010). Drivers are used to taking their mobile cell phones with them to their cars. As a result, distraction continues to be raised as a road safety issue (Texting Thumb Bands, 2015). In the USA, about 18% of drivers agree that they have sent messages or emails while driving (Tison, Chaudhary and Cosgrove, 2011). Men and women drivers are likely (24%, 25%) to report that there is no difference in their driving performance while texting and driving. Another study in the USA shows that 77% of young adults are certain that they can text and drive safely whereas 55% claim that it is easy to text while driving. This shows that people do not perceive texting and driving as a distraction (Texting Thumb Bands, 2015). Consequently, this is a problem because most of them will experience crashes because of texting and driving. Many people, thus, may be confident that they can drive while texting with no impact on their driving performance (Chaudhary et al, 2011). This research explores the performance of drivers while texting and driving.

The study of Chaudhary et al (2001) demonstrates that 72% of drivers recognised two seconds or less as the maximum duration for taking their eyes from the road before driving becomes significantly more dangerous. All passengers felt very unsafe when the driver was texting or reading a text while driving. Therefore, this study investigated the safety perceptions of drivers and passengers.

There are many studies which have been done in the USA but very little in South Africa. The Automobile Association of South Africa (AA) (2015) postulates that on average 40 people die and 25 are permanently disabled on our roads daily. Some of these accidents may be caused by distracted driving.

In the study by Texting Thumb Bands (2015) in the USA it was shown that texting while driving is becoming a national epidemic and a growing trend. It revealed that in USA drivers of age 18 to 20 involved in a wrecks admitted to texting and talking on their cell phone at the time of the accident. According to McLaughlin, Owens, and Sudweeks (2010), texting while driving resulted in higher mental demands, more frequent and longer glances away from the roadway. As a result, it hinders drivers' visual and

steering behaviours. The in-vehicle system showed improvement but performance was not at baseline levels during message sending.

Spencer (2014) in United Kingdom (UK) said texting while driving delays reaction times by 37% whereas drinking to legal limit slows drivers' reactions by 13%. Speaking on a hand-held telephone remains the most unsafe and delays reaction time by 46%. This study, in consequence, investigated the performance of drivers while texting.

For this study, the perception of the driver towards texting and driving is important. The experience of drivers in South Africa was evaluated in order to find the impact of texting and driving. This research also explored accidents which occurred and/or almost occurred as a result of texting and driving. During this study, the researcher observed texting and driving behaviour of South African drivers. Interviews were conducted with traffic officers because they are relevant to the study in terms of their knowledge and the records of drivers they have caught texting and driving. The major concern for this study was to examine whether technology use, i.e., texting and driving, had an impact on accident rates in South Africa.

1.2 RESEARCH PROBLEM

There is paucity of research reports about texting and distracted driving in South Africa. Most people do not realise that texting while driving is a problem.

Texting requires much time as the participants must pay attention to the details texted. This could put the drivers in danger as they keep their eyes off the road. The AA's research echoes that during the morning traffic peak (07:00 – 08:30), 7.2% of the 2500 drivers observed were holding and using their mobile phones while driving. This research explored effects of technology use, in respect of texting and driving in South Africa. Some drivers might be texting while stopped at traffic lights only, yet the texting might delay them from moving on when the traffic lights change for them, thus heavy traffic flow might result. This research investigated the impact of texting and driving on road safety in South Africa.

1.3 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

There are limited studies on technological distractions and driving in South Africa. Most studies have been done in the USA. However, the literature reviewed and theoretical discussions are structured under the following themes.

1.3.1 Literature Review

1.3.1.1 Texting and mobility: always available communication culture

Youth are the ones who are being distracted more by technology because they are more exposed to it than any age group (Zickuhr, 2011). Technological devices may distract the youth from sleeping, reading or working on something. Although listening to music while walking may be motivating, it can also cause distraction in terms of focusing on road safety. Technology convergence had led to most devices having a music player. As a result, most youth have the facility to play music anywhere on their cell phones or mp3 music players.

People often use headphones to listen to music while walking in the street. The retrospective study revealed an increase in incidents involving those wearing headphones, and it discovered 116 reports of death or injury of pedestrians between 2004 and 2011(2012). Mogg's (2012) study shows that most of these victims were male (68 per cent), with 67% under 30 years of age. This type of accident could be when someone is hit by car or is robbed by thugs.

Texting and walking is another form of technological distraction which can cause injuries. Levy (2014) maintains that even though injuries from texting and driving are typically more serious, injuries from texting and walking occur more often. Some accidents which may occur because of texting and walking include falling down stairs, tripping over clutter, bumping into walls and people or stepping into traffic (Levy, 2014).

1.3.1.2 Technological distraction

Technological devices and software become more prevalent daily. As a result, there is an increase in the technological distraction epidemic. Most people try to multi-task and this in return can compromise the performance of their activities. According to Goldman (2015) people escape distraction because technology enabled them to access it every day and every minute and this severely challenges one's life-work balance. Technology has left people feeling as if there is not enough time to do everything and this in return pushes people to multi-task. People tend to cut sleep time in an effort to finish the endless to do list (Goldman, 2015).

Technological distraction is not only affecting happiness but also health and people's brains. Multi-tasking has been identified as a silent killer in brain research. The brain needs full attention on one activity at a time. Subsequently, multi-tasking is not a safe thing to do (Goldman, 2015).

Technology addiction is another epidemic in our society which leads to a massive distraction. Most people may not realise that they are addicted to technology use but the reality is that some people cannot spend even a few minutes without checking their devices. Technology addiction can be seen as a medical disorder which needs to be treated. There are technology addiction clinics open in many countries in the world in order to cut citizens off from their smart phones and computers. Schools that are concerned about the popularity of texting, selfies and multi-player online games have been looking for help from such clinics (McNamee, 2014).

1.3.1.3 Distracted driving

Distracted driving can simply mean driving while doing something extra. This means engaging in another activity such as texting or reading messages while driving. Many studies have been done pertaining to the phenomenon of distracted driving. The NHTSA defines a driver's distraction as any activity that diverts a driver's attention away from the task of driving. This could mean the rolling up or down of a window, changing a song on a tape, texting or making phone call. All these could distract a driver (NHTSA,

2013). All types of distraction could reduce driver's attention to driving. According to Dingus et al (2014:55) distracted driving has been defined as the "diversion of attention away from activities critical for safe driving toward a competing activity".

A study done by Chaudhary et al (2011) reveals that most drivers believe texting does not have an impact on their driving performance while 90% of passengers felt unsafe. Stimpson and Wilson (2010) note that since 2005 texting volume appeared to be contributing to a disturbing rise in distracted driving fatalities in USA. Fatalities due to distracted driving increased 28% after 2005, rising from 4572 fatalities to 5870 in 2008. Crashes increasingly involved male drivers driving alone in collisions with roadside obstructions in urban areas. Anderson, Burris, Ibrahim and Wagenaar (2011) reported that texting and driving distraction was identified as a factor in 16% of all fatal crashes recorded in the Fatality Analysis Reporting System (FARS) in 2008.

Smart phones are now possessed by nearly three-quarters of adults, with many applications and social networks to attend to. A delay in reaction time on the roads could possibly lead to car accidents. Cell phone usage during driving can delay the reaction to potential dangers, increase following distances, and reduce the driver's ability to observe the surroundings. Nine percent of people have been predicted to use their cell phone while driving. Drivers might engage in different activities while driving but the use of cell phones has gathered most public and mass-media interest (Klauer et al, 2014).

The Road Transport Management Corporation (RTMC) reports in 2011 reflected that in South Africa there was only a one percent rate of offences for using cellular phones while driving a vehicle. However, the accuracy of this might be compromised because most drivers hide their phones when they see traffic officers. A study by Atchley, Atwood and Boulton (2010) reported that 70% of the 348 young adult drivers studied reported initiating texts while driving while higher numbers replied to texts (81%) and read texts (92%) while driving. The perception of risk was a very weak predictor of behaviour (for initiating texts) or had no effect on texting (for replying or reading texts while driving).

Perception or awareness of distraction effects may affect a driver's willingness or decision to text while driving. This means that if a driver realises that texting while driving is dangerous, their chance to text while driving is minimal. However, should a driver have a perception that texting while driving does not compromise performance, the decision to text while driving can be maximised. In other words, the driver may be overconfident that he or she could drive with a texting distraction (Horrey, Lesch and Garabet, 2007). It was found that males drivers were more confident than females drivers that they could drive without being distracted by their cell phones. It is important to understand the perceived or misperceived distraction which is the gap between a driver's estimate of the effects of distraction and the actual performance (Horrey et al, 2007).

1.3.2 THEORETICAL FRAMEWORK

1.3.2.1 Technological determinism and unintended consequences of technology

Technological determinism refers to a phenomenon or theory about the relationship between technology and society. This means the way in which society is shaped by the technology or the influence which it has on our society (Hesketh, 2001). Technological determinism is divided into two. There is the utopian view which is concerned about the positivity of technology and dystopian view which is concerned about the negative impact of technology. Hesketh (2001) notes that historically, in the United States, there is a clarification policy that improvement in the mechanical and industrial arts adopted social progress was replaced over the course of the nineteenth and early twentieth centuries by a more technocratic concept of progress in which improvements in technical and economic productivity became ends in themselves, instead of the means for creating desired social ends. During this era, the older meaning of technology as systematic knowledge of crafts and industry was joined to the anthropological one of the artefacts and related practices of a culture (Hesketh, 2001).

Postman (1998) claims that every new technological advantage adds to technological disadvantage. This disadvantage may exceed the advantage of the new technology or the benefit may not be worth the cost. People in our society appreciate the advantages of technology and observe them as a blessing, but they fail to realise that disadvantages that come with these advantages. This imbalance is dangerous since the greater wonders of the new technology leads to greater negative consequences in our society (Postman, 1998).

Technological innovations always change our society massively. Every technological development affects the way in which things are done in the society. Postman (1998) stressed that the consequences of technological change in our society are continuously vast, mostly unpredictable and largely irreversible.

Hence this study uses the dystopian approach because it postulates the way in which technology is a risk to our society. It is relevant for this study because the main aim of this study was to investigate the impact of texting while driving on road safety in South Africa.

The dystopian approach views technology as a vehicle which may intensify human sorrow. Technological dystopianism examines how certain technologies "facilitate a social order that is relentlessly harsh, destructive and miserable" (Kling, 1996:42). Technology has come to fight against us, it has stolen our natural way of doing things by making life to seem impossible to live without it. The dystopian approach to technological determinism postulates that we are under attack by the technology which is killing our society. Furthermore, the dystopian view of technology postulates that the more innovative technology darkens our society. The studies of Rogers (2003) and Hetland (2012) reflect that dystopian view technology as risk and it may be ungovernable.

This research also uses the unintended consequences of technology theory which can be defined as technological innovations that have unintended effects that come with the adoption of that technology (Nworie and Haughton, 2008). Naimi and French (2009) say that as much as people would want to use technology to their advantage for overcoming

their geographical boundaries, time, distance and other barriers, it is vital to realise that the technological innovation may yield unintended consequences.

This shows that when people text while driving it's a clear interpretation that technology has influenced them negatively. Texting while driving can be dangerous yet most people do. This is because most have become addicted to a technological application which has led them to believe that they can multi-task and this in turn is risky to do. These approaches assisted the study with the understanding of technology and its relationship with people's behaviour and norms. The dystopian approach of technological determinism and the unintended consequences of technology guided the researcher to achieve the aim of this study. More information from the literature review and the theoretical frame is discussed in chapters Two, Three, and Four.

1.4 PURPOSE OF THE STUDY

1.4.1 Aim of the study

The aim of this study was to examine the prevalence and the impact of texting and driving on road safety in South Africa.

1.4.2 Objectives of the study

This study sought to achieve the following objective:

- To explore the prevalence of distracted driving.
- To inspect the perception of drivers towards texting and driving.
- To investigate the cultural and social impact of texting and mobility as a form of always-available communication culture.
- To discover ways of curbing texting and driving on South African roads.

1.5. RESEARCH METHODOLOGY

Research methodology is the approach the researcher uses to tackle the research problem and includes guide line to achieve the overall aim of the study. This study identified the issue of the impact of technology use, such as texting and driving on road safety in South Africa. Therefore, a mixed methodology (qualitative and quantitative method) was regarded as appropriate methodology for this study. According to Leedy and Ormrod (2013: 134) in qualitative research, researcher often formulates a general research problem and raises a general question about the issue. Investigative, exploratory and interpretive research questions are relevant for qualitative research. The qualitative method enables the researcher to attain in-depth knowledge about particular phenomenon, develop new concepts about phenomena and discover problems that persists with the phenomenon. Furthermore, a qualitative research method enables a researcher arrive at the validity of a certain assumptions, claims, theories or generations in our context (Leedy and Ormrod, 2013:134).

Quantitative research involves looking at amounts or quantities of one or more variable by measuring them in some numerical from. Leedy and Ormrod (2013:191) state that the purpose of quantitative research design is to confirm and validate, explain, predict and test a theory. The quantitative method allows the researcher to objectively measure variables of interest. The quantitative method tries to generalise on a study based on measured quantities (Angelopulo and Barker, 2013:40). This means that the quantitative method uses a number of people with certain behaviours to constitute particular results about participants.

1.6 Research Design

This research is explorative research with a mixed methodology. The mixed method is used because it offers strengths that equalise the limitations of both qualitative and quantitative research. The mixed methodology was used because it had a high possibility of yielding depth information which helped to achieve the aim and objectives

of this study. To accomplish the objectives of this study, the methods of data collection included questionnaires, interviews and observations. In this way, the interpretation of data used qualitative and quantitative research methods.

1.7 SAMPLING

1.7.1 Quantitative methodology sampling (Survey)

One hundred drivers from Polokwane, Limpopo Province filled in questionnaires. Random and convenience selection of youth and adult drivers from Mankweng and Polokwane City formed part of the study.

1.7.2 Qualitative methodology sampling (Interviews and observation)

Two traffic officers from the Polokwane Municipality Department of Transport were interviewed. Face-to-face interviews with traffic officers were conducted in order to understand their experiences with drivers who are technologically distracted while driving. An interview guide was developed which best addressed the aim of the study.

During observation the researcher only observed drivers who were technologically distracted while driving. A site under the bridge just before the Mall of the North, which is on Munnik Ave (R81) was selected for the observations because it is one of the busiest areas in Polokwane.

1.8 DATA COLLECTION METHODS

1.8.1 Quantitative data collection instruments

1.8.1.1 Survey

One of the methods that was used to collect data was questionnaires. The questionnaires were structured in a self-administrated and researcher-administrated questionnaire format because there were drivers who preferred that researcher filled in

the questionnaires and then provided their views. The researcher designed questionnaires with questions that best address the objectives of the study. All participants were given enough time by the researcher. Questionnaires are an inexpensive, quick and easy way to collect data for a research study. They can effectively gather information relevant to the research study.

1.8.2 Qualitative data collection instruments

1.8.2.1. Interviews

In this research, interview data which assisted in achieving the objectives of this study was collected. A good preparation of the interviews was done in order to ensure the collection of relevant information. All interviews were recorded. This study used face-to-face interviews with two traffic officers from the Polokwane Municipality Traffic Department so that they could share their experiences about this problem.

1.8.2.2 Observation

Non-participant observation was another vital data collection method which was used in this research. The researcher spent three hours under the bridge just before Mall of the North which is on Munnik Ave (R81) while observing the behaviour of the drivers. The researcher also spent two hours traffic lights at Munnik Ave (R81) just before Mall of the North observing the behaviour of drivers. The researcher was as objective as possible in identifying and categorising the driving behaviours which were observed during the study. An observation guide which addressed the aim of the study was developed by the researcher.

1.9 DATA ANALYSIS

Data analysis is the interpretation of data to address the aim and objectives of a study. Quantitative and qualitative data (mixed method) was analysed based on what had

been found. The researcher looked at the answers of the respondents to the questionnaires, the interviews and the observations.

1.9.1 Quantitative data analysis

1.9.1.1 Questionnaires

To analyse quantitative data, the data from questionnaires (Appendix 1) was loaded into the Statistical Package for the Social Sciences (SPSS) for analysis. The findings of the research from the questionnaires were coded and inserted into SPSS in order to interpret the findings. SPSS produced statistical data which was used by the researcher for interpretation. An existing theoretical framework lent structure and support during the interpretation process (Leedy and Ormrod, 2013: 144).

1.9.1.2 Observation

Data collected through non-participatory observation was counted, grouped and coded. The coded numbers were then loaded into SPSS.

1.9.2 Qualitative data analysis

1.9.2.1 Interviews

Qualitative data collected through interviews was analysed through the use of thematic analysis. Thematic analysis can be used in identifying, analysing and reporting patterns within data (Braun and Clarke, 2006). This means firstly the filling of data into a data base and the breaking of large elements into smaller ones. Secondly, the researcher perused the data to get its overall sense and jotted down preliminary interpretations. Thirdly, the data was classified into categories. Lastly, the proposition or hypothesis that describes relationships among the categories was done (Leedy and Ormrod, 2013: 158). Based on data provided by the participants, the researcher organised, interpreted what the participants had said, grouped and produced the general outcomes.

1.9.2.2 Observation

Apart from numerically counting the numbers of drivers who were distracted by using certain technology while driving; the researcher wrote observation notes and remarks (See Appendix 2). Therefore, the notes were analysed using thematic analysis to reveal the pattern of themes that arose from researcher's remarks.

1.10 RELIABILITY, VALIDITY AND OBJECTIVITY

The questionnaires which were used for data collection were designed in a way that best measured and addressed the objectives of the study. Nominal and ordinal measurement scales were used in the questionnaires with relevant values and variables. A questionnaire is a reliable, convenient and relevant measurement tool which can be used to collect data from a large number of participants. In this case, about one hundred drivers participated in the study. A pilot study was conducted to test the designed questionnaire so that it could be adjusted if it did not measure what it was supposed to measure. Drivers are valid sources of information for data collection; they provide personal accounts of their experiences about driving and technology distraction.

Traffic officers were reliable and valid candidates for the interviews in this study because they are government officials who deal with traffic issues on a daily basis on South African roads hence they can be trusted to provide valid accounts of their experiences. The questionnaires and interviews provided self-reported information from the participants, while the observations were reliable and valid instruments in collecting first-hand data.

In this study, measurements were reliable to the extent that they could be repeatable or consistent. Thus, other researchers should be able to obtain the same results if they were to do the same research. The three methods of data collection which were used made the study reliable. Data collection methods give information from different perspectives.

To achieve the objectives of the study, the researcher avoided subjectivity on the data collected by not giving his opinion to the respondents. In this way, the researcher did not influence the respondents during data collection.

1.10 BIAS

The researcher conducted the research with an open mind to avoid any bias in the study. The same questions were asked of all the respondents. Random sampling was used to minimise bias and only traffic officers were interviewed to extract data that was objective. Moreover, the respondents were made aware of the confidentiality of the study to ensure that they were comfortable and would provide honest responses.

1.11 ETHICAL CONSIDERATIONS

Ethics is concerned with the right or wrong doing of individuals. For the purpose of ethics consideration, before the respondents took part in the study, the researcher introduced himself to the respondents. The respondents had the right to know what the research was all about and what the purpose of research was. The researcher then explained to the respondents all information regarding the study (Bless, Smith and Sithole, 2013:32).

Confidentiality is a prerequisite in a research study. In this way, respondents' personal information is private and protected, thus, their information will not be revealed. Respondents' names were not recorded. However, every respondent was given a unique identity number could be used to identify the different respondents.

Respondents had the right to discontinue with their participation should they have felt that they need and they were not forced to continue. Their wish to discontinue with the participation was not questioned. Instead, it was be respected. It is unethical to change the data collected from the respondents. The researcher did not in any way change data collected because such action could have been serious transgression (Bless et al,

2013:33). Information provided was not be modified in away and the researcher provide the interpreted data with objectivity.

1.12 SIGNIFICANCE OF THE STUDY

There are limited studies on distracted driving in South Africa. Hence, this is a problem in our society. Consequently the significance of this study is to assess the impact of texting and driving in South Africa. This study contributes to communication scholarship with information that could also be used to address distracted driving.

There is little research in South Africa as far as texting and distracted driving is concerned. Most researches about distracted driving are done in USA. As much as people in South Africa also text while driving, this means there is necessity to study about distracted driving.

This study provides solutions to the problem of the research mentioned. This study formulates knowledge of South Africa experiences towards distracted driving. The results of this study could contribute to reducing the number of accidents and saving lives of South Africans.

With many studies in the USA and other countries which postulate a negative impact due to distracted driving, this study hypothesised undesirable results of texting while driving. The motivation for such hypothesizing was the observation of young adults drivers in South Africa who use their mobile phones while driving; a practice which could be dangerous.

1.13 RESEARCH STRUCTURE

Chapter 1: Background of the study

Chapter 2: Technology and mobility: the always available communication culture

Chapter 3: Technological distraction

Chapter 4: Theoretical framework: technological determinism and unintended consequences of technology

Chapter 5: Research methodology

Chapter 6: Prevalence of technology use, texting and driving

Chapter 7: The impact and awareness of the danger of technology use and distracted driving

Chapter 8: Summary, recommendations and conclusion.

CHAPTER 2

TECHNOLOGY AND MOBILITY: THE ALWAYS-AVAILABLE COMMUNICATION CULTURE

2.1 INTRODUCTION

Information and Communication Technologies (ICT) have fundamentally changed the way we live and have become an important aspect of our lives (Salehan and Negahban, 2013). Many individuals, particularly the youth, utilise these innovations regularly and for different purposes. Individuals use technology to study, to scan for data on the web, to play games, and to speak with others (Salehan and Negahban, 2013).

This chapter reviews literature of previous studies on texting and mobility as the “always-available” communication culture. The *always-available communication culture* means that people are always reachable anywhere at any time through technology. The flexibility of technological devices has led to mobility, meaning people are able to carry their devices anywhere and anytime. Hence, they can communicate without the limitations of space or time. Different researchers have discovered different results about this always available communication culture. Some of these studies are discussed below. The literature to be reviewed will be from both international and local studies. However, there are few studies about technology in South Africa when compared to other countries such as the USA. The relevance of these previous studies will be discussed in this research.

2.2 ALWAYS-AVAILABLE COMMUNICATION CULTURE

Statistics South Africa (2015) revealed that in 2012, R91, 6 billion was spent by South African households on ICT products, which is 4, 6% of overall household costs. This shows that South Africans make use of technology. Kemp (2015) notes that in Africa, there are 298 million active internet users with 103 million social media accounts. This shows that the penetration of the internet in Africa has grown. In this way the people will

remain glued to their technologies. Kemp (2015) projects that Africans spent 51% of their time the accessing the internet through laptops and 31% accessing it through mobile cell phones.

Haste (2005) researched the role of mobile phones in young people's lives and their impact. Haste conducted a survey with a sample of 1,058 males and female who were between the ages of 11 to 21 in Britain. This study found that 95% of the respondents had mobile cell phones, while 88% had computers with internet access. The author stresses that mobile cell phones are personal, personalised, and are more than just an instrument. The new technology enables people to communicate via text everywhere, at any particular time (Haste, 2005).

In a recent study, Forgays, Hyman and Schreiber (2013) examined the use of mobile cell phones by 18 to 68 year olds of different genders and settings in which mobile cell phones are considered appropriate. The authors used 662 participants who were well-educated and gathered information through an online survey. They also looked at how quickly one was expected to respond to a text message. It was revealed that there is no difference between genders on how someone is expected to reply. However, young groups expect a quicker response. The study further showed that when people expected one to respond to their text message and one delayed, they got irritated. It has been found that people get extremely irritated when their romantic partner delays (Forgays, Hyman and Schreiber, 2013). This indicates that mobile cell phones make people think that others are always available to text anywhere at any time because of the access to this technology.

Many people text while walking in different locations. This may at times be a distraction that could lead to accidents. Matyszczyk (2015) states that people who text while walking without looking up have often fallen into many things, such as a fountain. A 27-year-old woman in Florida allegedly walked into moving freight train. It is alleged that she did not notice that the freight train was rolling through. As a result, the train truck struck her and threw her into the air (Matyszczyk, 2015). This accident therefore portrays that texting and walking is a serious problem and which could cause death in the worst cases.

Mobile cell phones have made taking a picture easy. People take pictures everywhere they go and post them on various social media. ‘Instagram’ is one of the most popular social media as far as sharing pictures is concerned. However, at some point, this advantage could be identified as a problem. There is societal pressure which makes people shoot pictures at different locations so that other people can see where one has been (Matyszczyk, 2015).

Postman (1998) postulated that the media tends to become mythic, meaning that human culture perceives technological tools as gifts of nature not as artefacts produced in a specific political and historical context. When technology is perceived as mythic, it becomes dangerous because it is accepted as it is and thus in turn makes it difficult to control or modify (Postman, 1998). If a suggestion were to be made to everyone in our society to switch their phones off from 6pm until the following morning, they would think is ridiculous idea. This is because they would think one was suggesting that nature should change, as if one were saying the sun should rise at 10am instead of 6am (Postman, 1998). This means that people will always be bonded to technology.

2.2.1 The impact of convergence on the always-available culture

The development of technology has led to portability, flexibility and convergence of technological devices. This has made it possible for people to easily carry their devices such as mobile cell phones and music players everywhere they go. The mobile cell phone, however, is the most common device among adults with 85% of Americans, aged 18 and older owning a cell phone (Zickuhr, 2011). In South Africa, there are 79.1 million mobile connections and there was a 16% growth since January 2014 in the number of mobile subscriptions (Kemp, 2015). Many factors contribute to the culture of ‘always available’. Technological convergence plays a huge role in this culture.

Papadakis (2009) has looked at opportunities and challenges that come with technological convergence and defines technological convergence as “a process by which telecommunications, information technology and the media, sectors that originally operated largely independent of one another, are growing together.” The author put

forward that technological convergence has enabled consumers to integrate in a flawless way, whereby the functions of entertainment, the internet, message applications and features such as camera, audio and radio are all in one device to execute multiple activities. Thus, people in society enjoy the opportunity of convergence that brings them multiple communication services in one device. For an example, mobile cell phones allow people to make calls, browse the internet, receive television shows or shoot pictures (Papadakis, 2009).

Battard and Mangematin (2012) studied the way in which people use technological devices and manage to communicate beyond borders which have been eradicated by mobile cell phones, in Ireland. The authors state that mobile technology has enabled connectedness of individual everywhere at any time. However, the constant connection has been found to influence work effectiveness, satisfaction of individuals, and the balance between private and working lives. The authors postulate that the new technology has either space hindrance to receive or text anyone in the world. The world has become a global village. The authors also put forward the idea that mobility of technology intrudes into the lives of individuals. For example, a manager at work could get a call from their family during work-time and which could disturb him or her mentally. Battard and Mangematin (2012) further found that the most commonly used features on mobile phone was that of texting and taking pictures because they disclose a means of communication and of personalisation. The authors also discovered that mobile technology is being used to store private pictures, work documents, text messages, contacts, etc.

Harwood, Dooley, Scott and Joiner (2014) investigated the relationship between smart device use, smart mobile cell phone involvement and mental health in Australia. The authors used 274 participants who completed an online survey which requested demographic information and mobile cell phone usage information. The authors put forward that mobile cell phones enable users to do more activities on one device. During their investigation, they found that smart- devices that comprise many features in one device, were predictive of stress and sadness. They argued that the extent to which it is used does not matter. Rather the nature of usage does. Harwood et al (2014)

further postulated that as much as technological development has benefits, it is important to understand the cost that comes with these benefits such as being available anywhere at any time. The authors highlighted that research should continue in order to alert people to the technological benefits but without suffering from their negative impact. This means that the negative impact of the always available culture should be made aware to people in society.

2.2.2 Always-available communication culture- The end of solitude and implication for privacy

The always available communication culture has implication on people's ability to be alone without interference. Deresiewicz (2009) maintains that technology has created a new culture in the society. The culture of the celebrity has been enabled by cameras whereas computers are enhancing the connectivity culture. The author suggests that individuals want to be known, recognised, visible and stay connected. Interestingly, Deresiewicz (2009) state that the gigantic modern terror is anonymity. Furthermore, the author argues that technology has stolen the moments of privacy and concentration. Moreover, it is taking away the opportunity of being alone. Deresiewicz (2009) argues that people stay connected on social networks because visibility tends to secure our self-esteem and this replaces genuine connection. The author says that it was once easy to feel lonely. However in today's world it is impossible to be alone, since we are always connected.

Heaney (2015) looked at the impact of technology on privacy. The author explains privacy as "*the right to be left alone and free from surveillance and unreasonable personal intrusions*". Heaney says that technology has decreased privacy and opened up the society.

Britz (1996) identified different categories of private information which can be intruded upon via technology

- *Private Communication.* This is personal information that an individual does not wish to share with other people. For example, contracts between employer and employee.
- *Privacy of body.* This is the secret medical information that an individual wants to keep confidential.
- *Personal information.* Personal information is the information of a particular person.
- *Information about one's possessions.* This is the information regarding what an individual owns.

Hosale (2013) suggests that the internet has stripped down privacy in today's world. In this way, people in our society no longer have a sense of privacy because they reveal their personal information on different social networks (Hosale, 2013). On social media people freely update their moves, giving out Google maps and giving out personal information online (Hosale, 2013).

In South Africa, it has been found that most people spent much of their time connected. Kemp (2015) reflected that South Africans spent about five hours and six minutes on the internet via personal computers or tablets, three hours and four minutes on mobile internet and three hours and ten minutes on social media daily

The above studies have indicated that the invasion of privacy by technology is an epidemic facing our society. It is unfortunate that our society tends to be blinded by technology and fails to see that technology can invade their privacy. This is because they always want to be seen and be forever accessible.

2.2.3 Always-available communication culture and the implication for language

The constant use of technology has impacted on language use in society. Purcell, Buchanan and Friedrich (2013) studied the impact of technological devices on how students write and are taught in schools in the USA. In the study, the authors used

focus groups and an online survey as their data collection methods. Over two thousand survey respondents (2,462) reflected that teachers observe technology as a tool that shapes students' writing in a myriad of ways and also as a supportive instrument for teaching high school and middle school students. Teachers who participated in this study also viewed technologies, such as cell phone and texting and social networks, as generally helping students to be creative, to express themselves freely, and to encourage students to write more often in more formats when compared to prior generations.

However, teachers have pointed out the challenges faced in this digital era, which includes the style of informal writing in assignments and that there is need for intensive knowledge about plagiarism. Purcell, et al (2013) further found that there is an ambiguous line between formal and informal language. Moreover, the authors revealed that the challenge concerning language is to educate students about different ways of writing for different targets using appropriate voices and registers.

Watt (2010) studied literacy skill and language learning by children in the context of the communication culture that is driven by technology. Watt maintains that technology use by children over the past decades has increased dramatically. The technological devices such as computers and mobile cell phones and which are popular electronic communication media, represent a different method of communication through speech and writing electronically. Watt explored the literacy and language skills of children and observed that technological communication can contribute positively to language and literacy skills if children could access relevant and appropriate language and content.

On the other hand, McFarlane (2010) studied the impact and consequences of technology in the society. The author found that the need for efficiency by means of time limitation on communication by people in the society has led to contracted language and a particular way of speaking. As a result, society is faced with sub-standard idiomatic expressions. This is common among the youth of the current generation who are mostly influenced by technology. Computers and mobile cell phone messaging has resulted in new jargons and has changed the way people talk. This appears to affect most the English Language (McFarlane, 2010). The author further

argues that learning institutions have adopted technology as part of learning but have failed to see the negative side of it. McFarlane maintains that many graduates from educational institutions lack essential skills to communicate both verbally and in writing. Thus they fail to attain responsibility that they are given in workplace. The author postulates that technology has led to a communication crisis, in that people are becoming unable to communicate efficiently.

The always available communication culture has changed nature of language. This is because people tend to chat on social networks for a long duration with multiple individuals at the same time. In this way, they have a tendency of typing fast using short words and abbreviations which eventually transfer from being acceptable in social communication to their unacceptability in formal communication.

A South African study by Geerstsema, Hyman and van Deventer (2011) found that non-standard spelling and abbreviation is being used in texting messages, which ultimately affects the language knowledge in terms of formal and informal language. This means that people get used to text messaging language (slang) to the extent that they even use it where it's not appropriate, such as in formal writing.

2.3 THE SOCIAL AND CULTURAL IMPLICATIONS OF ‘ALWAYS-AVAILABLE CULTURE’: CONSEQUENCES OF TECHNOLOGY, CYBERCRIME AND CYBER BULLYING.

The always available communication culture has implications for social and cultural issues in society. DeLoatch (2015) says that we live in a world where people embrace the use of technological devices such as iPads and cell phones during classes, tweets during meetings and TV's to teach students. Technology has come with many advantages such as in teaching. For example, providing diversity of lessons, increased student participation and new perspectives to the class (De Loatch, 2015). However, according to DeLoatch (2015) there technological benefits have long-term consequences such as:

- Technology changes a child's thinking – Children's brains can be affected negatively through the use of technology. Children who spend most of their time online might be effective in finding information but might find it difficult to understand.
- Technology changes the way children feel – A child's ability to empathise can be affected by technology. This is because they interact mostly online rather than face-to-face, and therefore they may be unable to pick up some emotions.
- Technology may lead to a privacy and safety risk – Some people may share person information on social networks that may be used against them.
- More technology usage with less physical activity leads to obesity – people spend most of their time on their computers and put aside physical activities such as exercise and walking and thus could lead to obesity.

Hosale (2013) shows that one of the negative impacts of technology can be linked to bad sleeping habit. Most people get sucked into internet activities that keep them awake during the night while busy browsing the internet for different purposes (Hosale, 2013). As a result, this affects the sleep pattern of people. Hence people do not sleep enough while they are on their technological devices. Hosale (2013) postulates that there should not be technology in a bedroom to acquire healthy sleeping patterns.

Webster (2013) pointed out cyber bullying as one of the technological challenges our society faces. Cyber bullying is a fast-growing trend that can be regarded as more dangerous than typical bullying at schools. Webster (2013:01) defines cyber bullying as "*bullying through information and communication technologies, mediums such as mobile phone text messages, emails, phone calls, internet chat rooms, instant messaging – and the latest trend – social networking websites such as MySpace, Facebook and Bebo*". The author reflects that victims of cyber bullying can be reached at any time anywhere, thus children are faced with threatening or embarrassing messages on their technological devices anytime and anywhere. Webster (2013) further maintains that every cyber bullying incident is harmful and could result in a teenagers' suicide or the suffering of anger, shame, depression and this may lead to withdrawal.

A company called KPMG identified cybercrime as a risk that internet users and governments are faced with in this era where online communication is a norm. As cyber criminals continue to expand and advance their strategy, they also shift their point of focus to business espionage and accessing information from government (KPMG, 2011). KPMG further said that there are different types of attacks such as viruses and worms, spam emails, Trojans, denial of service, malware, phishing fiscal fraud, state cyber-attacks and carders.

2.4 TECHNOLOGY AND SOCIAL RELATIONS

Kemp (2015) reflected that South Africans spent 32% of their time on social media every day. This shows that the always available culture is also driven by the use of social media, and mobility is driven by the flexible devices that are available. This is because they want to make use of social media for social relationships.

There are different studies with different perspectives concerning the relationship between technology and social relations (Salehan and Negahban, 2013). Whereas some researchers have observed technology as negative aspect of social relationships, some have viewed it as a positive aspect. The followings studies project different views and results that were researched about technology and social relations in our society.

Technological innovation specialists grasp the utilisation of technology communication and are naturally inclined to view them as being valuable in social relations (Anderson and Rainie, 2010). The developing prominence of social networks in the course of recent years has had a critical effect on individual and professional levels (Anderson and Rainie, 2010). For example, people are able to communicate with each other over boundaries. Moreover, today's workplace is all about technological use for facilitation.

The internet has been embraced universally at an astounding rate due to its abilities for communication and association – for creating, developing, and maintaining social relationships (Anderson and Rainie, 2010). One major advantage is that email, social networking instruments and different applications permit individuals to maintain bigger

social media networks and allow people to experience social networks even more (Anderson and Rainie, 2010). These authors further note that advances in technological innovation between now and 2020 will keep on broadening social potential outcomes (Anderson and Rainie, 2010).

Salehan and Negahban (2013) put forward that bigger network size is related to bigger a social circle and subsequently more communication. Since mobile cell phones give simple, quick and consistent association, they provide an exceptionally effective method for communication for individuals that need consistent association with others. The mobile cell phone gives immediate communication for individuals through distinctive channels, for example, voice communication, messaging, and the web. The diversity of communication channels for mobile cell phones permits them to communicate anywhere, at any time with huge volumes of communication with inexhaustible number of individuals. Thus, the more those individuals need interchanges the more they will utilise their mobile cell phones (Salehan and Negahban, 2013).

The study of Salehan and Negahban (2013) further postulates that individuals who have a large number of associations on Social Networking Services (SNS) can utilise their mobile cell phones to keep up their SNS connections. The introduction of texting applications enables people to have the chance of being constantly joined with their SNS and communicate with their friends and families.

Youth mobile cell phone users are likely through their mobile phones to engage in concerning sequences of behaviour. There are number of internal and external factors like self and social influences which could influence a youth's behaviour on a mobile cell phone (Walsh, White, Cox and Young, 2010).

In South Africa, the WhatsApp application is the most active social platform with 31% of the total percentage of social media active users, followed by Facebook with 26% and Facebook Messenger with 19% (Kemp, 2015).

One of the main characteristics of this youth culture is to use mobile cell phones as a means to portray one's status among friends (Abeele, Antheunis and Schouten, 2013). There are extensive differences in terms of their utilisation of, and attitudes towards, this

technology (Abeele et al, 2013). Thus, technology has led to a new culture which determines how people associate in society.

Walsh et al (2010) maintained that over the last 20 years since the introduction of mobile cell phones, the youth has adopted mobile cell phones as a fundamental element of their daily lives. Walsh et al (2010) note that youth prefer to utilise their mobile cell phones to communicate with others through the use of text messages and calling. Moreover, they like functions of the mobile cell phone such as accessing the internet to download music, watch sports, and take photos. All these new technological features have shifted mobile cell phones from being a mere telecommunication tool to a mobile computer, thus increasing the popularity of the mobile cell phones in this era.

Walsh et al (2010) state that mobile cell phones have been used by people in society, particularly youth, to reflect self-identity. This self-identity is being used to reflect one's value amongst the peers (Walsh et al, 2010). This means that mobile cell phones become a materialistic reflection of the self. People in the society, therefore, judge each other according to the value of the mobile cell phone one owns.

On the other hand, these technological advantages came together with a negative impact on social relations. Different scholars have researched technology and social relations.

Advanced mobile cell phones have changed today's communication method, offering various benefits and enabling users to reach every corner of the earth (Tan, Pamuk and Dönder, 2013). The study by Tan et al (2013) shows that people who engage constantly with mobile cell phones, may decrease time allocated for social relations especially face-to-face interaction. This means that more individuals engage through their mobile cell phones and that results in great loneliness.

Perlman and Peplau (1981, in Tan et al 2013) explained loneliness as a negative emotion that comes about through a discrepancy between desired and achieved levels of social contact.

The advantage of technology raises new questions of socio-cultural effects and the meaning of communication (Oksman and Turtiainen, 2004). The mobile communication includes variations resulting from cultures of the family and the traditional approaches of socialisation prevalent in the society. Today's generations differ from the previous generations with the huge use of mobile communications and new media. Hence this makes the current generation experience things differently. Texting, playing games, internet browsing and chatting are the new communication culture activities (Oksman and Turtiainen, 2004).

Abeele et al (2013), argue that mobile cell phones can be used by youth to show their popularity among their friends. This means that mobile cell phones provide youth with tools with which to help quantify their popularity. With the advent of smart phones that have different features, people use these mobile cell phones to distinguish themselves in terms of these materials. Abeele et al (2013), further postulate that people associate their dialling registers and the number of message they receive with their reputation amongst their friends.

Forgays, Hyman and Schreiber (2013) note that mobile cell phones initially offered people the luxury of immediate contact with other people on social networks anywhere and at anytime. Their study, however, shows that these mobile cell phones have transformed a luxury to an appendage. The ability to text everywhere at anytime has changed enormously the usage landscape in a short period of time (Forgays et al 2013).

The study of Wei and Lo (2006) in Forgays et al (2013) shows that females spend more time utilising the telephone to join with loved ones while males utilise the telephone to acquire data. Furthermore, these distinguished sex contrasts in communication style are likewise apparent in the social rules for mobile cell phone utilisation. As a case in point, there may be contrasts not just in how men and women use their cell hours but additionally these are contrasts in the settings in which they see mobile cell phone use as acceptable.

Furthermore, psychological benefits came with these new technological features which increased the bond between mobile cell phones and the user, and in so doing facilitated social inclusion (Walsh et al, 2010). However, these benefits of technological development have led to some problems, leading people to use their mobile anywhere and at anytime. For example, there are students who lose concentration in the classroom because of texting.

Thus, the above studies show the way in which technology has impacted upon our social relations. One of the objectives of this study was to investigate the cultural impact of texting and mobility as a new form of communication culture, thus, these studies have indicated how technology changed the way in which relationships are formed and the way people view or value each other in a society. Texting has changed the communication culture dramatically. People always want to be connected, thus they use technology to stay online constantly. The always available culture in this way has also been led by social relation among people in our society.

The next chapter looks at technological addiction and distraction in locations such as classrooms and the workplace, pedestrian distraction and road safety, and distracted driving.

CHAPTER 3

TECHNOLOGICAL DISTRACTION

3.1 INTRODUCTION

This chapter will look at technological distraction, i.e. how technology use interrupts activities of people in the society. Whereas the previous chapter focused on how technology created an always available communication culture, this chapter focuses on technology addiction, technology use by pedestrians and which causes distractions, road safety and distracted driving.

3.2 TECHNOLOGY ADDICTION

Recently, Social Networking Sites (SNS) have grown rapidly, gaining popularity in the society. SNSs are now more than just websites. They provide people with connectivity using various methods such as email, web, and mobile applications (Salehan and Negahban, 2013). There are applications which now can be installed on mobile cell phones to communicate such as Facebook, WhatsApp and Twitter. However, advantages of technology also come with some disadvantages whereby social issues arise during adoption. This consists of using mobile cell phones in banned and risky situations, compulsive use, and addiction (Salehan and Negahban, 2013).

Brod (1984 in Salehan and Negahban, 2013) posits that excessive use of a mobile cell phone can be viewed as a type of technological stress. Almost everything is available on the internet. The internet is becoming a crucial part of people's lives in society, but it is also becoming a societal epidemic for both organisations and individuals. The always available communication culture has led to internet addiction.

Thatcher (2005) studied internet behaviour and biographical characteristics which are linked with the problematic usage of the internet in South Africa. The study used questionnaires which were placed in online magazines for volunteers to complete. The

survey used 1 795 questionnaires where the majority of the participants were male. The results reflected that the problem of internet usage is low compared to other countries. However, the study reflected that 863 males and 305 females among these internet users were at risk of internet addiction.

Addiction can be explained as repetitive acts that constitute negative consequences (Salehan and Negahban, 2013). The use of mobile cell phones has penetrated today's generation. Thus mobile cell phone addiction can be seen as one of today's epidemics.

Salehan and Negahban (2013) studied how SNSs can lead to technological addiction in the USA. Their study used 209 participants through a survey which had 39% females and 61% males. Their study revealed that SNS applications play a critical role in mobile addiction. In this way, SNS, can be seen as a vital predictor of cell phone addiction. The study by Salehan and Negahban (2013) further revealed that all genders have the potential risk of technological addiction. However, it was found that gender would affect mobile cell phone addiction. Moreover, women tend to be more addicted to mobile cell phone than men (Salehan and Negahban, 2013).

Writer (2013) stated that South African students are actually addicted to social media and they believe that this social media could help them excel during examinations. Writer (2013) observed that through the study by World Wide Worx and Students Brands, 59% of students admitted that they were addicted to social media. On the other hand, only 16% said they were extremely addicted while only 18% of the students claimed that they were not addicted. Furthermore, the study revealed that 62% of respondents were addicted to instant messaging whereas 22% said that they were extremely addicted to the quick fix of a quick chat. Interestingly, they did not consider it a bad thing. Writer (2013) further stated that the study revealed that 45% of students admitted that technology distracted their studies and about 10% thought it was a regular problem. However, the study revealed that 81% of students believed that technology enhanced their lives.

Park (2005) posits that mobile cell phone addiction is connected with various factors such as loneliness and personal habits. This means that this new form of

communication actually leads to depression in individuals as a result of addiction. Park (2005) stated that the characteristics of mobile cell phone addiction could be seen as feeling uncomfortable and annoyed when the mobile cell phone is not available.

Toda, Monden, Kubo, and Morimoto (2006) researched relationship between mobile intensity and a related lifestyle amongst Japan's university students. Toda et al (2006) revealed that mobile cell phone usage rates were associated with smoking habits and Health Practice Index (HPI) in men. The impact was not considerable in women. Furthermore, women tend to have a greater indirect communication preference than men. As a result, men use voice cell phone services while women prefer internet services (Toda et al, 2006).

Walsh, et al (2010) studied Australian youth's involvement and behaviour with their mobile cell phones. Their study (through the online survey) used 292 participants, who were between the age of 16 and 24. Their study actually tried to find psychological benefits of using mobile cell phone and the prevalence of mobile addiction. Walsh et al (2010) established cognitive factors such as self-identity, a need to belong and in-group norm that are related to mobile usage amongst Australian young people. Walsh et al (2010) found that mobile cell phones are very popular amongst youth. In this way psychological benefits arise from the use of mobile cell phones.

Carroll, Howard, Peck and Murphy (2002) revealed that the use of mobile cell phones, especially by females, provided them with feelings of safety and security, particularly when they were alone during the night because they could quickly keep in touch with others. Reassurance was therefore provided through the use of the mobiles for some users.

Cassidy (2006) suggested that there are similarities amongst the youth's mobile phone usage and obsessive behavior. The study of Cassidy shows that youth relate mobile cell phone users with optimistic attributes such as popularity and success. Thus, the youth may participate in different behaviours that are perceived as optimistic attributes to enhance the relationships amongst their social group in the society. Cassidy further

indicated that the use of mobile cell phones amongst the youth might possibly comprise a positive effect rather than an addiction that is negative.

McNamee (2014) noted that technological addiction is a problem in our society and prompts huge distraction. The vast majority of individuals may not understand that they are dependent on technological innovation usage. However, without a doubt, few individuals cannot pass a couple of minutes without checking their devices. This innovation habit can be seen as a restorative issue which needs to be dealt with (McNamee, 2014). There are innovation compulsion facilities open in numerous nations all designed to cut residents from their cell phones and processes. Schools that are worried about the addiction of messaging, selfies and multi-player web amusements have been searching for assistance from technology rehabilitation centres in order to reduce addiction (McNamee, 2014).

3.3 TECHNOLOGICAL DISTRACTION IN CLASSROOM AND WORKPLACE

This section focuses on how the use of technology impacts upon the workplace and causes technological distractions in classrooms.

Purcell and Rainie (2014) studied the impact of technology on workers. The study was done through an online survey of 1 066 internet users who were 18 years of age or older. The web and mobile phones have infiltrated work places and computerised innovation has changed a number of occupations (Purcell and Rainie, 2014). In the work environment, individuals may utilise innovation for diverse reasons such as doing their work, communicating inside the work place or communicating with other companions. Email and the web are viewed as the most critical and pertinent method for correspondence among online specialists. The investigation of Purcell and Rainie (2014) in the USA demonstrated that around 7% of online occupation holders say that the web distracts them. As a result they get to be less productive.

Salehan and Negahban (2013) established that the internet is not only providing distracting in the personal lives of individuals but it also making organisations concerned

about the productivity of their employees, network jamming and corporate data privacy. The penetration of mobile devices allows anytime-anywhere internet connectivity together with extensive use of different social networks on mobile cell phones. In this way, the exacerbation of both social and personal problems related to the internet technology and mobile cell phones may result.

In a recent study by Bester and Brand (2013) on the impact of technology on South African leaner's attention and their academic achievement, the researcher used an experimental and a control group with 23 and 22 learners from Grade 8. Bester and Brand (2013) implemented the use of technology with the learners but excluded those who were in control group. Afterwards, they compared the achievements of those exposed to technology with those with no technology during class time. Bester and Brand (2013) found that there were major differences among to learners with technology compared to those with no technology in terms of average achievement and concentration during lessons. Thus, it was concluded that technology plays a crucial role for a better average achievement and concentration of learners.

Where students do not work out how to focus and close out diversions, exploration shows that they will have a much harder time exceeding expectations in every territory (Schwartz, 2013). This implies that technological innovation prompts partitioned attention in the classroom and this lead to disappointment.

Crosswhite, Rice and Asay (2013) studied tendencies, behaviour patterns and the reasons for texting among family members and examined the impact of texting on familiar relationships amongst youth. Their study revealed that 66.1% of participants send and receive more than 1000 texts per month. Moreover, the most widely recognised reason relatives contact one another is to pass on information, followed by planning activities, general discussion, and the sending pictures or jokes. The slightest normal motivation to text relatives is to strengthen relationships and to keep them busy during free time. The results established both differences and similarities between male and female messaging practices with their families (Crosswhite, et al, 2013).

Writer (2013) discusses a study done by World Wide Worx and Student Brands, which examined the usage of social media by South African students. The study involved 1435 participants and revealed that Facebook is the most popular social destination for students in South Africa, with 96% of respondents utilising it, while Twitter is utilised by 70% of respondents (Writer, 2013). Google+ is ranked third, at 47%, on account of the pervasive utilisation of Google Apps for understudy accounts at colleges (Writer, 2013). Mxit still holds a solid client base with 39% of respondents reporting they were utilising it. LinkedIn, the expert system, guarantees a 29% offer, generally among students who are nearing the end of their studies and who utilise it for work prospects.

Writer (2013) stated that the study revealed that 68% of students join the Internet by means of cell phones, 61% through laptops, 50% on desktop PCs – to a great extent utilising colleges' and universities' machines – and 20% connect on tablets. The pattern is driven by a few establishments giving laptops and tablets to students, and the minimal effort financing of gadgets by financial services administrations like Eduloan. Regarding channels of access, 60% utilise Wi-Fi on campus, 40% utilise 3G modems, and 39% utilise mobile data on their mobile cell phones.

Balogun, Monteiro, Pheko and Tlhano (2013) note that teachers describe the overall impact of digital technology on student research skills as mostly being positive but they detected mixed effects. Their study assessed the impact of digital technologies and the internet on the habits of students and found that 77% said that it had a positive impact. Twenty-three percent, on the other hand, claimed it had negative impact on their research work. This shows that as much as technology might assist people with different activities, negative impact may result.

These studies show how technology has impacted upon the lives of people negatively. Thus, these studies are relevant to this research because they present the results of texting and the always-available communication culture. Having mobile cell phones everywhere at any times; leads to addiction with distractions at school and workplace, as the studies have established.

3.4 TECHNOLOGY USE, PEDESTRIAN DISTRACTION AND ROAD SAFETY

The study by Lamberg and Muratori (2011) investigated the impact of using cell phones while walking by looking at the behaviour of individuals who use mobile cell phones while walking in the USA. To achieve this, Lamberg and Muratori (2011) used 36 healthy applicants randomly selected and who were assigned to either walk, walk while texting on a cell phone or walk while talking on a cell phone. The participants were observed to see the implications of cell phone usage while walking. Lamberg and Muratori (2011) found that mobile cell phone utilisation among pedestrians prompts an expanded psychological diversion with reduced concentration on the environment and increased unsafe behaviour. Multi-tasking, for example, such as talking or texting on a mobile cell phone while walking may meddle with operational memory and lead to walking errors. Most of studies have focused on cell phone use while driving as a significant public concern. However, attention has recently been paid to the use of mobile cell phones while walking (Lamberg and Muratori, 2011).

The use of mobile cell phone by pedestrians creates psychological distractions, decreases situational awareness (SA) and enhances insecure behaviour, all of which could lead to fatalities and injuries (Lamberg and Muratori, 2011). Furthermore, the study by Lamberg and Muratori (2011) suggested that the use of mobile cell phones while walking might result in users walking slowly, and they are not safe when crossing a street.

Productive execution of walking while utilising a mobile cell phone requires psychological capacities and a suitable regard for each. Thus, Lamberg and Muratori (2011) maintain that using mobile cell phones while walking would influence walking negatively. Moreover, the novel activity of texting while walking increases the danger of walking in to the road. This means that texting and walking could actually lead to unsafe circumstances like bumping into traffic, or another pedestrian or tripping, all of which could lead to injury.

Schwebel, Stavrinos, Byngton, Davis, O'Neal and De Jong, (2011) studied how talking on the phone and listening to music while walking may influence the safety of pedestrians in the USA. Data was collected using 138 college students through a virtual experiment. The results revealed that college students, who walked and talked, might be imperilled by the diversion of utilising handheld interactive media gadgets. Students who listened to music or messaged while crossing the road experienced more hits by vehicles than the virtual person in a pedestrian environment as the latter were not diverted. They also found that pedestrians distracted by multimedia did not pay attention to the surroundings while they were crossing the street (Schwebel, et al, 2011).

Schwebel et al (2011) suggested that as the usage of handheld media tools had exploded globally, safety specialists should start to consider the effects of such diversions while talking, text-messaging, or listening to music, on traffic security. Multimedia devices such as mobile cell phones and iPods can offer convenience and entertainment. The benefits, however, come with the potential disadvantage of positioning the user in a very hazardous environment (Schwebel, et al, 2011).

Schwebel et al (2011) revealed that pedestrians who text and listened to music encountered more hits in the virtual pedestrian surrounding than undistracted pedestrians. Texting, which includes correspondence trades as well as additionally perusing and writing, may be more subjectively diverting and attention-demanding than talking. Schwebel et al (2011) further found that pedestrians who texted while walking did not pause to re-focus on the traffic. Instead they typed while walking and this led to some texting errors.

Schwebel et al (2011) postulated that listening to music did not involve more cognitive complexity compared to conversation, as previous studies had shown that it had a minimum effect on safe automobile driving and safe pedestrian behaviour. However, the study of Nasar et al (2008) cited in Schwebel et al, 2011) reflected that listening to music may result in disconnected pedestrian behaviour. Schwebel et al (2011) further revealed that listening to music created a steady disturbance of auditory signage. This meant that one might not be able to hear that they were in danger. Distraction by

multimedia devices might have an impact on cognitive process and which could lead to the threat of a clash with the traffic (Schwebel et al, 2011).

Arrive Alive, the South African road safety campaign (2015) stated that road safety authorities are familiar with the threats of distraction to drivers and their disregard in concentrating on the diversions confronting pedestrians. Accidents often happen when pedestrians cross the roads and numerous situations appear to be the result of negligence of the part of the pedestrians. Therefore, when pedestrians are utilising mobile cell phones, divided attention may increase their danger of getting hit by car. Arrive Alive (2015) further maintained that there were technological developments which were being developed by engineers to make the pedestrians more alert to their surroundings.

The Arrive Alive campaign (2015) felt that for pedestrians, the majority of the information at a pedestrian crossing is acquired outwardly by viewing activity, seeing the markings and signage and watching the signs that demonstrate when it is safe to walk. Pedestrians who multi-task while texting on a mobile cell have a decreased psychological ability to detect possible risky exercises, for example, crossing roads (Arrive Alive, 2015).

Additionally, Arrive Alive highlighted that mobile cell phones provide convenience in responding to emergencies. However, they may also pose a risk. Arrive Alive (2015) put forward some tips for pedestrians and suggested that they should look out for traffic and reduce cell phone usage while crossing the road. When talking on phone, one should stay steady and avoid talking on a cell phone while walking. Pedestrians should stay alert to the surrounding; and be attentive close to level crossings.

Longnecker (2014) reported that there were cities that considered banning texting and walking. Regulators in Arkansas (a state in USA) and New York were working on laws that would ban pedestrians from texting and walking across a street (Longnecker, 2014). While U.S and other nations had passed the laws against texting and driving, pedestrians in Fort Lee, New Jersey now have to stop to text (Gates, 2012).

Furthermore, Gates (2012), reports that pedestrians have to pay a \$85 fine when caught texting while walking on the street.

These studies point to the observation that the communication culture of texting everywhere at any time could be dangerous to people in society. People die because they are concentrating on their mobile cell phone while they should be concentrating on the road as pedestrians. This section of the literature review is important for this study because it reflects the social and cultural implications of texting everywhere at any time.

3.5 DISTRACTED DRIVING AND TECHNOLOGY USE

The NHTSA in 2000 had identified driver distraction as a critical issue in society and defined it as “any activity that takes a driver’s attention away from the task of driving”. NHTSA (2013) defines distracted driving as “behaviour dangerous to drivers, passengers, and non-occupants alike”. The NHTSA conducted research which attempted to uncover factors which could cause distraction while driving. The NHTSA identified four types of distraction. These were visual distractions, biochemical distractions, auditory distractions and cognitive distractions. Visual distractions can be characterised as distractions which make the driver look away while driving. Biochemical distractions can be characterised as trying to adjust something in the car while driving. Auditory distractions are related to the distraction caused by a certain sound which disturbs the driver while driving. The cognitive distractions can be defined as having some deep thoughts or experiencing internal noise which makes the driver get lost in thought.

Arrive Alive (2015) has highlighted distracted driving as one of South Africa’s major causes of fatal accidents. Arrive Alive has outlined the most common distractions as reading newspapers, adjusting a radio or tape, smoking, fatigue, personal grooming and eating.

Harrison (2011) studied the prevalence and perceptions of college students towards texting while driving in the USA. The study used 103 participants with self-reported data, through an online questionnaire. The analysed data reflected that 91 college students

admitted that they had texted while driving and believed that it was dangerous. The study by Harrison further revealed that college students often do sexting and conduct argument while driving. Thus distractions may result.

Klauer, et al (2014) investigated distracted driving and the danger of accidents among learner and experienced drivers in England. The study looked at how secondary tasks such as cell phone use while driving could affect the performance of experienced and novice drivers to lead to crashes or near crashes. Klauer et al (2014) installed cameras, global positioning systems, accelerometers and other sensors in the cars of 42 drivers who had new licenses and 109 in cars of experienced drivers. Their study showed that the risk of crashes or near crashes increased drastically if the driver was distracted by a cell phone. Moreover, the prevalence of concentration on secondary activities while driving arose among novice drivers but not among experienced drivers.

Western Cape Transport and Public Works (2015) also commented that distracted driving is an issue which needs special attention since the National Safety Council highlighted that 33% of the brains activity in reading images decreases when talking on a phone. As a result, they launched a campaign in May 2015 titled "#ItCanWait" using a twitter handle @WCGovSafelyHome. They used different radio stations to advertise the campaign with the hope of reducing distraction on the road. During their campaign, Vodacom (a leading South African mobile communication company) joined the battle. The managing Executive of Vodacom Western Cape Albert Breed said "All drivers know that texting while driving is unsafe, but they often do not realise just how dangerous it is. Texting can keep your eyes off the road for as much as five (5) seconds at a time, so at 120km/h the vehicle would have travelled a distance equivalent to more than one and a half soccer pitches". Vodacom initiated an online game which portrayed what could happen if drivers text while driving (Western Cape Transport and Public Works, 2015).

Ossip (2014) suggests that South Africa is a country which has a high rate of accidents and this is because of poor driving behaviour. Ossip state that "It seems hardly believable that, despite legislation prohibiting it, two-thirds of drivers still use their cell phones while driving" (Ossip, 2014: para 6). Furthermore, according to Ossip "Many of these actually attempt to text while driving and, even though 40% of drivers have hands-

free kits, 80% of their calls are made without using them" (Ossip, 2014: Para: 6). An application developed by the Discovery Company in South Africa indicated that there was 52 seconds of distracted driving among drivers who had the application. This is equal to blind driving at 60km/h.

The NHTSA (2012) suggested that a reason for drivers to have a willingness to engage in other activities while driving was their workloads or just the driver's willingness to engage in other activities. Such distraction can be initiated by the driver and could be adjusting a mirror or radio. Alternatively, the distraction could be initiated by someone else such as a passenger calling the driver.

The research of the NHTSA was conducted because they realised that divided attention had caused accidents on USA roads. The NHTSA, however, pointed technology as the major distraction of drivers while driving. This was because of technological development and the always available culture that persists in our society. The NHTSA stressed that special attention was required to be given technological distractions while driving.

The study of Densu and Salifu (2014) in Ghana observed 9 868 drivers, of which 2.6% were using mobile cell phones while driving. The use of a mobile cell phone while driving was significantly linked to front-seat occupancy, the time of day, and vehicle type characteristics (Densu and Salifu, 2014).

In Nigeria, Olumami, Ojo and Mireku (2014) used 250 questionnaires on the habits and experiences of drivers. They found that the majority of the drivers did not, whether partially or totally, make or receive calls, send or read text messages, switch off or use cell phones in traffic. A further analysis showed that a greater percentage of the participants had not experienced road traffic accidents and run a stop sign as a result of using a mobile phone while driving. However, most of the respondents had practised slower reaction times to traffic signs and objects and lost control while using mobile phones while driving.

In Botswana, the study of Balogun et al (2013) reflected that the most prevalent distractions were; talking on the cell phone, looking around, talking to other occupants in

the car, drinking or eating, texting on the phone, looking at oneself on the mirror/putting on make-up/wearing glasses, fiddling with car controls, reading newspapers or maps, smoking cigarettes, and singing or dancing – in that order. The limited research available in Botswana regarding road safety suggested that a large proportion of road traffic accidents were as a result of human errors caused by the road-users' behaviour and which mainly included the decision to disobey the rules of the road.

A South African study revealed that road accidents involving pedestrians were among the major contributors to fatalities on South African roads (Arrive Alive, 2015). Moreover, urban and day-time offence charges showed enormously high rates clearly indicating that pedestrians of all ages disregard road rules at great personal risk (Arrive Alive, 2015). Road safety statistics in South Africa show that in 2009 there were 13 768 fatalities, 13 967 in 2010 and 13 954 in 2011 (Arrive Alive, 2015). Arrive Alive statistics show that:

- Human factors contributed 82, 85% to fatal crashes during 2009 and 84.91% in 2010. The vehicle factor contribution decreased from 9.13% in 2009 to 5.79% in 2010.
- The road and environment contributed 8.02% in 2009 and 9.3% in 2010. The reported contributory factors to fatal crashes during 2009 and 2010 are reflected in the general and respective human, vehicle and road and environment.
- During weekends, 65% of all fatal crashes could be attributed to the abuse of alcohol by both, drivers and pedestrians.
- Of the drivers tested for alcohol, 42% of those tested positive were women and 58% were male.
- The abuse of alcohol is especially prevalent amongst the urban upwardly mobile, the youth and other age categories in general, who do so mostly because they perceive the chances of being detected as being very low.

3.5.1 Legislation and Distracted Driving

According to the Road Traffic Ordinance in South Africa there is legislation on using a communication device while driving, as cited below:

Road Traffic Ordinance Regulation 308A Prohibition on use of communication device while driving at January 2006

(1) No person shall drive a vehicle on a public road – (a) while holding a cellular or mobile telephone or any other communication device in one or both hands or with any other part of the body; (b) while using or operating a cellular or mobile telephone or other communication device unless such a cellular or mobile telephone or other communication device is affixed to the vehicle or is part of the fixture in the vehicle and remains so affixed while being used or operated, or is specially adapted or designed to be affixed to the person of the driver as headgear, and is so used to enable such driver to use or operate such telephone or communication device without holding it in the manner contemplated in paragraph (a), and remains so affixed while being used or operated (South African Radio League. 2006)

This regulation, however, does not apply to people who are driving in execution of their duties, especially emergency response services of government such as police officers, traffic officers, ambulances and drivers of fire-fighting teams.

Arrive Alive (2015) maintains that texting while driving is a problematic offence to enforce and prosecute and put forward that 144 000 British drivers (18 to 24 years of age) were prosecuted for using their mobile while driving in 2014. Automobile manufacturers have joined the call to ban drivers from text messaging with cell phones and other hand-held devices.

Legislators have been reacting to research over the past few years and are gradually banning cell phone activity while driving. In the US about a dozen states have passed laws banning texting while driving. In USA the Automobile Club has announced a

campaign to get it banned in all 50 states. In the UK the Department for Transport said that driving and mobile phones do not mix (Arrive Alive 2015). That is why they increased the fine for illegally using mobile cell phones when driving to three penalty points and a £60 fine. It is expected that other nations will follow the example of similar enforcement and law changes to address the risks of distraction caused by texting while driving (Arrive Alive, 2015).

Writer (2013) reported that among 24 countries, South Africans are about twice more likely to send an email, text or utilise social media while driving. Writer reports that a study conducted by an organisation called Ipsos OTX, reflected that 41% of South Africans admitted that they broke the law by using their mobile cell phones while driving.

Crocket (2014) stated that texting while driving could reduce brake-reduction times by 18%. Thus when the driver delayed braking it ultimately caused accidents. This shows that the visual distraction caused by texting while driving can be dangerous.

The USA is one of the countries which are technologically advanced. As a result, the issue of texting and driving is one of their biggest problems. Albany (2013) reported the establishment of a Texting Zone as a strategy to reduce accidents which are caused by distracted driving. A Texting Zone is a platform for drivers to pull-over, rest and text (Albany, 2013). Albany reported that a total of 298 road signs relating to Texting Zones had been installed to alert drivers to all 91 Texting Zone locations. This was because it had been found that there had been a 365% increase in the number tickets issued in 2013 compared to 2012. The campaign of establishing Texting Zone has been seen as a tool in combatting the issue of texting (Albany, 2013). The following figures are examples of signage use to alert drivers about Texting Zone.

Figure: 3.1: Texting zone signage



(Picture by: Gareffa, 2013)

The USA has also signage on the roads which alerts people to stop texting while driving (See figure 3.2).

Figure: 3.2 Texting zone signage



(Picture by: Carr and Carr Attorneys at Law)

In this way, the issue of the always available communication culture contributes to the driving distraction caused by cell phones. People continue to stay online with their mobile cell phone when they are busy driving and as a result cause fatal accidents.

3.6 CONCLUSION

This chapter portrayed the implication of the ‘always available communication culture’ and how it could lead to technology distraction in classrooms; workplaces and other environments. It also focused on pedestrian distraction and road safety, distracted driving and technology use. The following chapter will focus on theories which served as a guideline for this study. This study uses technological determinism and the unintended consequences of technology which shows the negative impact of technology on society.

CHAPTER 4

THEORETICAL FRAMEWORK: TECHNOLOGICAL DETERMINISM AND UNINTENDED CONSEQUENCES OF TECHNOLOGY.

4.1 INTRODUCTION

This chapter focuses on the theoretical framework that serves as a general guideline for this research. For this study, different theories which highlight the negative impact of technology on society are relevant. Technological determinism and the unintended consequences of technology were chosen because they relate to the core of this research.

4.2 TECHNOLOGICAL DETERMINISM

Hesketh (2001:15495) defines technological determinism as “*a pervasive, yet controversial, theory about the relationship between technology and society*”. This is negative and positive impact of technology on society. The main concern about technological determinism is how and why technology is being developed and the relationship between technological change and social change in the society (Hesketh, 2001). Bimber (1990) states that the term technological determinism is concept which applied to the various views which people in a society have about technology. Moreover, Bimber (1990) says that:

Technological determinism ranges from positive descriptions of an inevitable or autonomous technological order based on certain laws, to claims that technology is the dominant factor in social change but that its influence derives from the cultural meaning or importance given to it by people (Bimber, 1990:02).

Adler (2006) says that technological determinism is about how technology is being utilised in a society. From time to time the world has changed because of technology. This is because technology affects human lives in society in the different societal

sectors such as politics, economics, and education. This technology influences social behaviour and the cultures of people around the globe (Adler, 2006). In addition, technological determinism has been seen as a phenomenon that affects socio-economic configurations such as the transformation from feudalism to capitalism, the rising of the information age, labour skills and globalisation (Adler, 2006). Furthermore, Adler (2006) says that many scholars have researched through different approaches, technology and societal relationships.

Technology has been viewed by different scholars as a driver of societal change. Pannabecker (1991) maintains that technology causes a major force which leads to collisions within the society. In this way, the author likens social change in society to an epidemic in which technology has played a core role in causing it. Pannabecker (1991) emphasises that the technological impact on society is like that of hammer on a nail meaning that the technology affects important aspects of society such as culture, language, and values. Human decision-making is affected by the technological environment. This is because the daily interactions and activities are done using technology (Pannabecker, 1991).

The rise of technology use has led to scholars questioning whether the technology shapes society or if the society influences the technological choices. Adler (2006) says that technological determinism is about the ideology of how technology is important in human lives. A relevant example of this is how technology has changed society and economies. However, the question still remains; is change brought about by technology good or bad?

Salazar-Acosta and Holbrook (2008) are of the view that technology can be viewed as an element of society which can be adjusted for change. Thus, technology does not move at its own pace but is influenced by social factors (Salazar-Acosta and Holbrook, 2008). Furthermore, Salazar-Acosta and Holbrook (2008) maintain that technology is controlled by humanity in terms of the changes it can bring in a society.

This shows that technology does not only influence our behaviour and habits, but also our brains. The above literature reflects how technology has shaped the world.

This complements this research because it shows how technology can impact upon behaviour and the always available communication culture.

4.2.1 Types of technological determinism

There are two types of technological determinism, namely the utopian view and the dystopian view. The utopian view is concerned about the positivity of technology and the dystopian view is concerned about the negative impact of technology (Hesketh, 2001). This means that a utopian view of technology sees technology as good for our society, mainly because of the advantages it brings with it. Moreover, the utopian view of technology does not see any negative impact of technology but only a positive side to it. Howcroft and Fitzgerald (1998) state that the development of new technologies has created a mind-set of technology as an opportunity for a new era of plenitude, democracy, knowledge and equity. In this way, technology is viewed as a phenomenon which is beneficial to the society.

4.2.1.1 Utopianism

The utopian view point can be defined as phenomena that “explore the perfectibility of human society through hypothetical advancements in technology, philosophy, and social structures, resulting in perfect or near-perfect communities located in distant lands or in the future” (Siski, 1997). The utopian view of technology believes that “the information superhighway is often presented as the universal cure-all for the social ills that have plagued humanity and many seem convinced that it will somehow transform society into a better place” (Howcroft and Fitzgerald, 1998). This view of technology also shows that humans can now strengthen their personal relationships and communities because of technology (Howcroft and Fitzgerald, 1998).

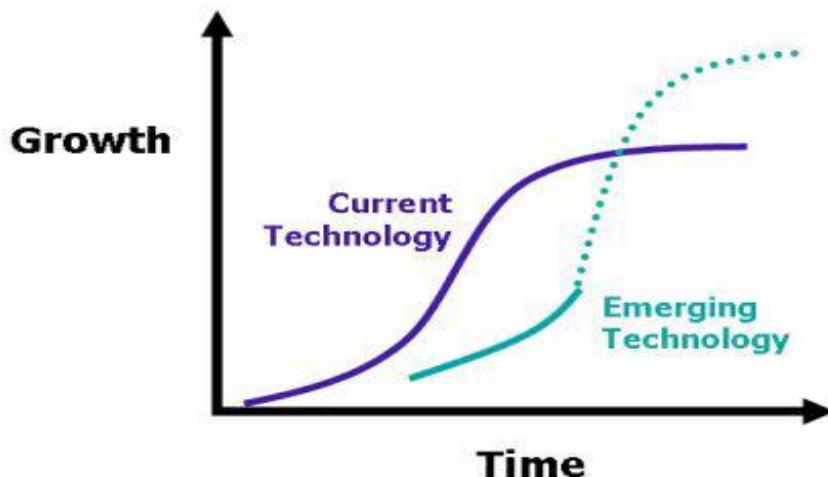
McLuhan (1969) maintains that technology is all about communication. It has given humanity the ability to reach further through space and time. Hence time and geographical barrier are no more, thanks to technology. People are now able to communicate at any time anywhere. Furthermore, McLuhan (1969) shows that

technology-led cars which extend our feet, different equipment or machines that extend our arms, radio that echoes our voices and television which shows different cultures have all brought drastic and positive change in society.

The world has now become a global village, where technology has destroyed the concept of space and time. McLuhan (1968) suggests that technology has changed the world from being made of separate units into one system that is connected through the power of technology. In this way, technology has expanded human communication to reach anywhere in the world without any barrier, thus changing the way of doing things.

Salazar-Acosta and Holbrook (2008) state there are two views of technological innovation, namely an economic view and a social view. The social view of technological innovations is concerned about how technology is adopted and adapted within the society. The economic view suggests that when there is innovation, then new markets, new resources, new processes, new products and new organisations will be developed (Salazar-Acosta and Holbrook, 2008).

Figure 4.1: Two views of technological innovation



(Salazar-Acosta and Holbrook, 2008)

This graph reflects that, as time goes by, new technology will emerge. As a result, there will be growth in the economy.

4.2.1.2 Dystopianism

Postman (1998) defines the dystopian view of technology as a phenomenon which is a threat to our society. This means that the dystopian view of technology claims that technology is bad for our society because of its disadvantage. Scholars have researched how technologies worsen human misery, that is, how technology plays a role in human suffering (Howcroft and Fitzgerald, 1998). Dystopianism examines how innovations of technology establish a social order which is persistently destructive, harsh and miserable (Howcroft and Fitzgerald, 1998).

There are ongoing debates about the positivity and negativity of technology in our society by scholars. Salazar-Acosta and Holbrook (2008:13) state that:

The idea of technological determinism as a theory of technology implies that technologies are autonomous, they develop at their own pace without human intervention, they have quasi magical powers, and they acquire a life of their own once introduced into society.

This reflects that technology can attack our society and shape its format. This is what dystopianism highlights, the negativity of technology in our society. Howcroft and Fitzgerald (1998) say that technology can be viewed as a distraction from natural life because people tend to be attached to technology.

Carr (2010) contends that the internet has given us unrestricted information access through online communication and this enables us to communicate without borders. However, all the internet advantages come with a price. The internet has many things which interest humanity, therefore many people spend much of their time on the internet, thus their time is scattered (Carr, 2010). Furthermore, the author notes that the internet is not only affecting the way we read, but it also impact upon our thinking. This means that the utilisation of technology changes our brain structure and the way it works. Carr (2010) postulates that “the ability to concentrate intently over a long period of time, has to be practised and honed, because the natural state of the animal brain is one of distractedness”. This means that technology has also affected our concentration

levels. Carr (2010) points out that reading requires an attentive and a calm mind. The internet, however, has taken that away as people try to multi-task on computers while reading something else. Therefore, the information acquired from the internet might be difficult for the brain to store.

Keen (2007) postulates that there are many blogs on the internet which provide unreal news. In this way, children will not be able to distinguish between professional objective news and unreal news. The author assets that this is because everyone on the internet has the freedom to write their own version of reality hence it will be difficult to get reliable news. Keen (2007) supports this by highlighting that one of the most used websites, Wikipedia, does not have any professional journalists, editorial staff or even experience, yet people use it for serious things. This view shows that reality is now being shaped by the postings of individuals.

Keen (2007) further states that the mainstream media has now changed the way one uses the internet. Instead of using the internet to search for important information it is now being used as a mirror of oneself. This means that people now use social media to create news about their lives and for updating others about everything that is happening in their lives. Keen (2007) calls this self-advertisement, where people talk about their vacations, favourite movies, music, etc.

In Carr's 'Is Google Making Us Stupid?' (2008), he portrays that the internet does not only provides us with information, but also shapes the process of information, thoughts and concentration. In this way, the information is acquired in the form in which the internet distributes it. Technology affects our mental habits. The way in which people think is being shaped by technology (Carr, 2008). The author further argues that people tend to skim throughout the internet. They do not want to use one source, therefore they move from one article to another. Carr (2008) believes that reading mobile cell phones has increased. However, the information acquired from them cannot be reliable. Carr (2008) says that:

Never has a communications system played so many roles in our lives—or exerted such broad influence over our thoughts—as the

Internet does today. Yet, for all that's been written about the Net, there's been little consideration of how, exactly, it's reprogramming us.

The Net's intellectual ethic remains obscure.

Technological determinism was chosen for this study because the dystopian view of technology says technology is bad. Hence this research shows that technology can have a negative impact in the society. In the case of this study, it establishes whether people get distracted by technology and such distraction causes accidents on South African roads.

4.3 Unintended consequences of technology

This research also uses the 'unintended consequences of technology theory' which can be defined as technological innovations that have unintended effects that come with the adoption of that technology (Nworie and Haughton, 2008). Zehner explains unintended consequences of technology as "unplanned outcomes that occur due to the implementation of a technology, policy, or other initiative" (2012:01). The unintended consequences of technology relate to the unintended impact that technology brings and which ultimately become undesirable phenomena for the society. Knopf (1996) says that unintended consequences are a revenge of technology whereby it produces the opposite of what it was planned for. This is referred as a "revenge effect". These unintended consequences produce negative impacts on the society. Mostly these unintended consequences are unforeseen (Knopf, 1996).

Zehner (2012) points out that the unintended consequences of technology can be categorised as detrimental, beneficial and controversial. Moreover, the author says that these unanticipated consequences of technology mostly follow directly or indifferently from activities of humans but happen at a future time and probably in a different place. As a result, unintended consequences could be difficult to evaluate and negate. Zehner further indicates that "the concept of unintended consequences

is central to moral philosophies of consequentialism, which hold that people should judge actions based on the outcomes they create" (2012:01).

Naimi and French (2009) emphasise that as much as people would want to use technology to their advantages for overcoming their geographical boundaries of time, distance and other barrier. It is vital to realise that the technological innovation may yield unintended consequences. There are other technologies which have worked as intended but have also produced unintended results. Things like nuclear energy which was aimed at producing cheap and extra-abundant electrical power also produced mass destruction weapons. Naimi and French (2009) believe that:

Technological innovation brings both new opportunities and new problems. They generate public support and resistance. And inevitably, the adoption of technological innovations leads to adaptation and uses not envisioned by the inventor. For every intended consequence, there will be an opposite and equally unintended consequence. And this fact triggers the ethical, legal and political controversies surrounding technological innovations (Naimi and French, 2009: 04)

Merton (1936) suggests that unintended effects are not always undesirable, meaning that from the initiator's point of view in the nature of the case, intended results are always positive although for observers or outsiders they might be perceived as negative (Merton, 1936). The author further indicates that the unintended consequences may be categorised into consequences of the mediator, initiator, social structure, civilisation and culture.

4.3.1 Types of Unintended Consequences of Technology.

Zehner (2012) highlights four types of unintended consequences as positive, negative, perverse and controversial.

Positive – This could be when unintended consequences produce better results which were not planned for.

Negative – This could be when the intended consequences yield positive and harmful side effects.

Perverse – This could be when consequences yield the opposite of the intended outcome.

Controversial – This could be when intended results yield detrimental consequences but some people view these as beneficial.

Merton (1936) has highlighted sources of unintended consequence as error, ignorance, immediacy which can be referred to as the desire to yield to short-term goals without thinking about the long-term results, self-defeating prophecy and basic values. This means that failure for careful and critical analysis of an innovation could backfire by producing unexpected outcomes. Nworie and Haughton (2008) argue that unintended consequences are often caused by a failure to critically understand and examine the context. Such action could foresee unintended outcomes of the innovation. In some cases, what causes unintended results could not be easily explained and recognised.

Nworie and Haughton (2008) further indicate that unintended consequences are not always negative; they do sometimes come with benefits (Nworie and Haughton, 2008). For example, a certain drug developed for a particular disease turns out to be powerful in curing a different disease. Negative or positive impacts of unintended consequence apply to technological innovation whereby certain innovations tend to be harmful to humanity instead of useful. People often get distracted by technology when driving, e.g. texting while driving. In the first place, texting was never meant to be done when driving. However, it is done by some people.

4.3.2 Technological innovation and change process

The ongoing technological innovation in our society will always change ways of doing things. When new technology is introduced, there is also an effort which is made by users to adopt the changes in order to achieve the intended benefits

(Nworie and Haughton, 2008). As much as technology can have benefits, it is also important to be alert to the unintended changes which it may produce (Nworie and Haughton, 2008). For instance, mobile cell phones can distract drivers when driving. Innovation can be viewed as an idea which can be useful for humanity. However, Blumenfeld, Fishman, Krajcik, Marx (2000) speculate that new innovations for societal issues could bring about unforeseen results or create issues that did not already exist.

The unintended consequences of technology highlight how technological innovation has caused a problem of unintended results. Hence, this study focuses on how people get distracted by their cell phones while driving whereas mobile cell phones were never made to be used while driving. This shows that the unintended consequences prevail in this case. There are drivers who have been distracted by technology while driving and their natural life has been taken away by technology. People are always glued to technologies. As a result we have an always available communication culture. These technologies were never meant to distract drivers, therefore, this could be perceived as an unintended consequence.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 INTRODUCTION

This chapter addresses the methodological approach used in the collection and analysis of data. It discusses the instruments used in collecting data to address the research problem. Research methodology is an approach used by the researcher to tackle the research problem and provides a guide line to achieve the overall aim of the study. The focus of this study was to identify the impact of texting and driving on road safety in South Africa, therefore, a mixed methodology (qualitative and quantitative method) was considered appropriate for this study.

5.2 RESEARCH DESIGN

This research adopted an exploratory research design. It set out to explore the prevalence of a social phenomenon, in this case, texting and driving. Exploratory research can be useful in identifying the consequences of research problems, and in becoming familiar with unknown situation and behaviour (du Plooy-Cilliers, Davis and Bezuidenhout, 2014)

A mixed methodology was used because it offers strength that equalises the limitations of both qualitative and quantitative research. A mixed methodology has a high possibility of yielding in-depth information which helped to achieve the aim and objectives of this study. In this way, to achieve the objectives of this study, questionnaires were used as a quantitative instrument, whilst interviews and observations were used as qualitative instruments. In this way, the interpretation of data was both qualitative and quantitative. All data collection instruments used managed to cover the aim and all the objectives of this study.

A mixed methodology provided a better approach to solve the problem of the study and to achieve the general aim of the study. Creswell (2008) suggests that when one type of research (qualitative or quantitative) is not good enough to address the problem of the study, then a mixed methodology should be applied.

5.3 SAMPLING

5.3.1 Quantitative methodology sampling (Survey)

One hundred drivers from Polokwane, Limpopo Province filled in questionnaires. Convenience sampling was used to select respondents for the survey. The researcher approached youth and adult drivers in the Mankweng shopping centre parking areas, University of Limpopo parking areas, the Mankweng complex and taxi rank and Polokwane city random parking lots. Twenty-five drivers were conveniently random chosen from each of the above mentioned areas. Below is a table which reflects the demographics of the drivers who participated in this study.

Table 5.1: Demographics of the drivers

Sex		Age		Highest education level		Driving experience	
Male	Female	Age range	No.	Levels	No.	Years of driving	No.
75	25	19-21 years	3	Grade 11 or lower	5	Less than a year	2
		22-29 years	49	Grade 12	20	Between 1 and 2 years	8
		30-40 years	29	Diploma or certificate	29	Between 3 and 5 years	25
		40+ years	19	Degree	19	5 years or more.	65
				Post-Graduate Degree	27		
Total		100	100		100		100

5.3.2 Qualitative methodology sampling

5.3.2.1 Interviews

The researcher went to the Polokwane Municipality Traffic Department to request access to traffic officers who could participate in this study. As a result, two officers were purposively selected and interviewed based on their extensive experience. Face-to-face interviews with traffic officers were conducted in order to understand their experiences with drivers who are technologically distracted while driving. An interview guide was developed which best addressed the aim of the study (See Appendix 3).

5.3.2.2 Observation

During observation, the researcher purposively observed those drivers who were technologically distracted while driving. The location selected for this observation was under the bridge just before the Mall of the North, which is on Munnik Ave (R81) in Polokwane. It was selected as the observation site because it is one of the busiest areas in Polokwane and because drivers use the road to drive into the mall and to leave it. The table below shows the demographics of the drivers that were observed in this study.

Table 5.2: The demographics of the drivers who were observed

Gender	Race		
Male	64	Black	55
Female	28	White	28
Total	92	Coloured	6
		India or Asian	3
		Total	92

5.4 DATA COLLECTION METHODS

5.4.1 Quantitative data collection instruments

5.4.1.1 Survey

One of the methods that was used to collect data was a questionnaires. Questionnaires are an inexpensive, quick and easy way to collect data for a research study. They can effectively gather information relevant to the research study.

The questionnaires were structured and self-administered. This means that the questionnaire was in a structure that enabled the participants to make crosses (X) to answer questions. However, there were drivers who preferred that the researcher filled

in the questionnaires while they provided their answers and views. The researcher designed questionnaires which best addressed the objectives of the study. Some of the questions in the questionnaires asked about driving experience (See Appendix 1). All participants were given enough time by the researcher. Drivers were approached at different parking areas. A pen was provided to participants to complete the questionnaires. The language of the questionnaires was made as simple as possible in order to avoid misinterpretation or misunderstanding. Here are some of the questions from the survey:

- Have you ever sent a text message while driving?
- Have you received and read a text message while driving?
- Have you ever stopped driving and parked on the side of the road to text or make a phone call?
- Do you think texting while driving is dangerous?

A major challenge which the researcher faced during collection of data was that some of the drivers could not read and understand English. Therefore the researcher had to translate into the Sepedi Language and explain each question. This also meant that the researcher had to listen to their responses which were in Sepedi, and then write them down in English. The other challenge was that some drivers were reluctant to participate in this study as they said that they were busy.

5.4.2 Qualitative data collection instruments

5.4.2.1 Interviews

In this research, interview data which helped to achieve the objectives of this study was collected. The Interview was chosen to get in-depth information from traffic officers about their experience with technology use while driving. Good preparation of the interview was done in order to ensure the collection of relevant information. All interviews were recorded for the quality capturing of information. The study conducted

face-to-face interview with two traffic officers from the Polokwane Municipality Traffic Department so that they could share their experiences of this problem.

This study used semi-structured interviews which enabled the researcher to do follow-ups questions to obtain more information and clarification based on the response of the participants. The researcher made the interview informal so that traffic officers could feel like they were engaging in a conversation with someone they knew. Thus, the traffic officers felt comfortable during the interviews. Here are some of the questions from the interview guide:

- Tell me about your experiences of drivers who text and drive?
- What are your views of drivers who talk on handheld cell phones while driving?
- Can you describe your experiences of accidents caused by texting while driving?

Some of the questions in the interview guide were answered before the researcher could ask. This means that the traffic officer would link an answer for one question to another. Follow-up questions were developed based on the answers that the law enforcers provided. Hence, in-depth information was gathered which assisted with solving the problem at hand. The questions asked during the interview were about their experience in dealing with technology use and driving and some strategies which could be used to curb technological distractions while driving (See Appendix 3). The advantage of a face-to-face interview is that it helps to establish a good relationship with interviewees, thus resulting into good cooperation (Leedy and Ormrod, 2013: 190). The good rapport established with the interviewees helped to obtain in-depth information for this study.

5.4.2.2 Observation

Non-participant observation is a vital data collection method and was used in this research. Observation was done because it produces first-hand and unfiltered data. Drivers who were technologically distracted were observed. The observation guide developed was used to record distracted driving behaviour. An observation guide which

addressed the aim of the study was developed by the researcher (See Appendix 2). The observation guide was designed in a simple way whereby the researcher would tick when a driver was technologically distracted, such as staring at a cell phone screen while driving.

The researcher spent three hours for a day under the bridge just before the Mall of the North which is on Munnik Ave (R81) while observing the behaviour of the drivers. The researcher also spent two hours at traffic lights at Munnik Ave (R81) just before the Mall of the North observing the behaviour of drivers. The researcher was as objective as possible in identifying and categorising the driving behaviour which was observed during the study. It was difficult sometimes to identify a particular technological distraction such as when drivers reached out to the dashboard. Hence, it was not clear if they were adjusting a radio, air conditioner or engaged in other activities.

5.5 DATA ANALYSIS

Quantitative and qualitative data (mixed method) were analysed based on what had been found. The researcher looked at the answers of the respondents from the questionnaires, the interviews and observation.

5.5.1 Quantitative data analysis

5.5.1.1 Questionnaires

To analyse quantitative data, the data from questionnaires (Appendix 1) were loaded into the Statistical Package for the Social Science (SPSS) for analysis. The findings of the research from the questionnaires were coded and inserted into SPSS in order to interpret the findings. Descriptive analysis was used to produce analysed data in terms of frequencies and percentages. Gender, age, education and driving experience were analysed with cross tabulation to produce findings in frequencies and percentages because they are important elements that affect the perception of technology use while driving. SPSS produced statistical data, which was used by the researcher for

interpretation. An existing theoretical framework lends structure and support during the interpretation process (Leedy and Ormrod, 2013: 144).

5.5.1.2 Observation

Data collected through non-participatory observation was counted, grouped and coded. Moreover, the coded numbers were loaded into the SPSS. Descriptive analysis was used to produce data in frequencies and percentages. Gender, race, and age was analysed in cross tabulation to produce frequencies and percentage.

5.5.2 Qualitative data analysis

5.5.2.1 Interviews

Qualitative data collected through interviews was analysed through the use of thematic analysis. Thematic analysis was used in identifying, analysing and reporting patterns within data (Braun and Clarke, 2006). The study used deductive and inductive coding. Thus the researcher developed an interview guide which focused on specific themes. However, emerging themes during the analysis were also noticed through scrutinising the data. On data provided by the traffic officers, the researcher organised and interpreted by listening to what the traffic officers had said to produce a general outcome.

5.5.2.2 Observation

Apart from numerically counting the number of drivers who were distracted by using certain technology while driving, the researcher wrote observation notes and remarks (see Appendix 2). The notes were then used to analyse, using thematic analysis to reveal the pattern of themes that arose from the researcher's remarks.

Patterns of themes that explain general outcomes were developed in this study according to type of technological distraction. In this way, the data presentation of the study was kept aligned to the themes. All information gathered from questionnaires,

observation and interviews, was presented through developed patterns of themes. The themes which were used in this study include:

- Texting and distracted driving (Visual Distraction)
- Cognitive distraction
- Auditory distraction (Loud music)
- Biomechanical Distraction
- Always-Available communication culture and distraction
- The impact of technology use, texting and distracted driving while driving.
- Awareness of danger of technological distraction and driving

Furthermore, findings are also presented in terms of the demographics of the drivers. This refers to the education level, driving experience, gender, race and age of the participants. This information helps with understanding the background of the participants of the study. In this way, the demographics assist with understanding the perceptions of drivers towards technological distractions.

5.6 RELIABILITY, VALIDITY AND OBJECTIVITY

The questionnaires which were used for data collection were designed in a way that best measured and addressed the objectives of the study. Nominal and ordinal measurement scales were used in the questionnaires with relevant values and variables. A questionnaire is a reliable, convenient and relevant measurement tool which can be used to collect data from a large number of participants. In this case, one hundred drivers participated in the study.

A pilot study was conducted to test the designed questionnaire so that it could be adjusted if it did not measure what it was supposed to measure. Drivers are valid sources of information for data collection. They provided first-hand personal accounts of their experiences about driving and technology distraction.

Traffic officers were reliable and valid candidates for the interview in this study because they are government officials who deal with traffic issues on a daily basis on South

African roads, hence they can be trusted to provide valid accounts of their experiences. This addressed the need to meet the trustworthiness quality criterion of this research. Whereas the questionnaires and interviews provided self-reported information from the participants, the observations were reliable and valid instruments to collect first-hand data. In this way, the researcher found data which was not influenced by any one.

In this study, measurements are reliable to the extent that they can be repeatable or consistent. Thus, other researchers should be able to obtain the same results if they were to do the same research. The three methods of data collection were used to make the study reliable. All data collection methods gave information from different perspectives. In this way, the reliability and validity of this study was maximised by also having three research tools which came together to solve the problem of the study.

To achieve the objectives of the study, the researcher avoided subjectivity in the data collected by not giving his opinions to the respondents. In this way, the researcher did not influence the respondents during data collection.

5.7 CONCLUSION

The study use one province and a small sample, therefore the data of this study may not be generalised to represent all drivers in South Africa. Furthermore, the observation location for this study was in Limpopo Province with majorly black drivers and, therefore, reports based on race may be compromised. This means that generalisability of the data may be limited to the population of the Limpopo Province.

This chapter provided in-depth information on how data was gathered and analysed. The next chapter provides the first part of the findings of this study. It presents findings on the prevalence of technology use, texting and driving on South African roads.

CHAPTER 6

PREVALENCE OF TECHNOLOGY USE, TEXTING AND DRIVING (DATA ANALYSIS & PRESENTATION)

6.1 INTRODUCTION

This chapter presents the prevalence of technology use and texting and driving based on the three data collection methods that were utilised, namely; observation, interviews and questionnaires. The existence of technology use, texting and driving has been proven by different scholars like Dingus et al (2014), where their study revealed that at least 9% of drivers are technologically distracted while driving. Texting and driving is a global concern. For example, in the USA, the NHTSA (2013) reflected that in 2011 there were 3 331 people who were killed and 387 drivers were injured as a result of distractions while driving. A study, also conducted in the USA, by Texting Thumb Bands (2015) showed that about 77% of young adult drivers believed that they could confidently text and drive. This suggests that if drivers believe that they can text and drive, they will do it more often.

This chapter presents findings in terms of themes. In this way, findings generated are grouped according to their subject matter. The data gathered through observation, interviews and questionnaires is presented in themes.

A total of 92 drivers were observed during this study. The researcher focused on four types of technological distractions, namely, *visual distraction*, *biomechanical distraction*, *auditory distraction* and *cognitive distraction* (See Appendix 2). Visual distraction may be when the driver is looking away from the road. Auditory distraction includes loud music and responding to a ringing cell phone. With biomechanical distraction drivers could be manually adjusting the radio volume. Cognitive distraction simply implies that one is lost in thought. This cognitive distraction may be caused by technological devices such as making a phone call via Bluetooth. This means that drivers who are using the Bluetooth device while driving may be distracted. Ranney et al (2001) believe that

cognitive distraction while driving can happen when the driver is responding to a ringing phone or making a call utilising the Bluetooth equipment in the vehicle.

The researcher observed drivers who were busy pressing their phone keypad. This could mean that drivers were either texting or dialling a number. Drivers who were reading messages or items on a cell phone screen were also observed and they were identified as drivers who were staring at their cell phones without in actual fact pressing them. The researcher also observed drivers who were talking on their cell phones while driving, as a result. In some cases drivers were identified with a cell phone in their hand and talking simultaneously.

Furthermore, drivers who were busy conversing on a cell phone with a wireless device were also observed. They were identified as drivers who were talking on a cell phone while alone in the car. Drivers who were distracted by adjusting the radio were also observed. They were identified through observing them reaching for the dashboard where the radio is placed. Drivers who were playing music aloud were also observed as distracted. This is an example of auditory distraction.

One of the objectives of this study was to investigate the cultural and social impact of texting and driving. Haste (2005) contends that the use technology is nurtured on a daily basis and it affects the way in which we live. Hence this chapter also presents the drivers' perceptions in terms of the always-available communication culture and its impact on their lives. Zickuhr (2011) suggests that youth are the ones who are mostly affected by this always-available communication culture because they are exposed to technology more than any other age group.

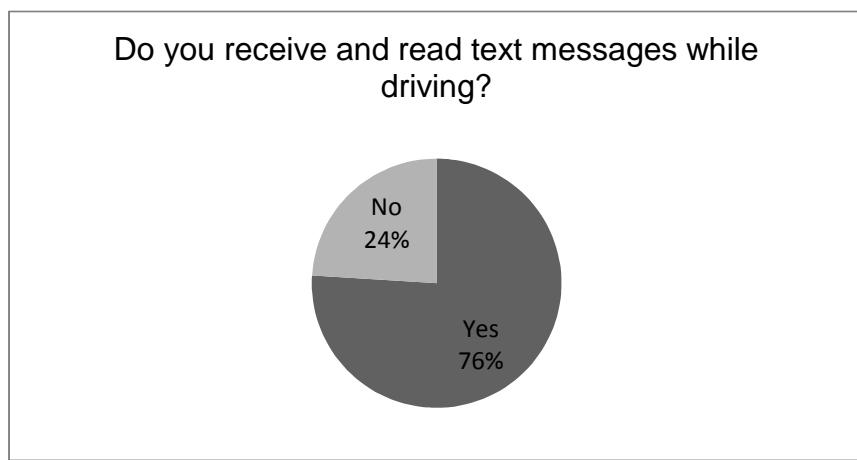
6.2 TEXTING AND DISTRACTED DRIVING (VISUAL DISTRACTION)

The NHTSA (2013) outlines visual distraction as taking one's eyes off the road while driving, such as reading a text message on a cell phone. Drivers who participated in this survey were asked if they had sent text message while driving. The findings of the study showed that 60% of drivers reported that they had sent a text while driving, whereas

40% of drivers claimed they did not and had not. This finding is critical in understanding visual distraction. Most respondents were visually distracted while driving because of technology. This is substantiated by the findings that showed that 76% of drivers reported that they read text messages while driving (See Figure 6.1). This shows that most drivers get distracted by reading texts rather than sending texts.

Interestingly, most drivers who text while driving, are the youth. The study indicated that 55% of drivers between the ages of 22 to 29 years had sent text messages while driving. Moreover, 52.6% of the drivers of the age group 22 to 29 years said that they had received and read text messages while driving. This clearly indicates that the young generation text more often than the older generation. There are a few older drivers who text while driving. The study showed that only 4.7 % of drivers who are 40 years and older text while driving.

Figure 6.1: Drivers who receive and read messages while driving



With regards to texting and driving, this research revealed that 57% of drivers who participated in this study reported that they sometimes text and drove. While 8% did this always there were 35% who did text and drive. Furthermore, the study revealed that texting and driving is done anywhere, be it on short-distance or long-distance trips. The survey showed that 6% of drivers in this study said that they text while driving on long-distances, the other 6% on short distances, while 14% did so on less busy roads and 24% said that they text everywhere. The fact that more than half of the respondents

(57%) claimed that they text and drive (sometimes) is a disturbing finding because this creates the potential for road accidents.

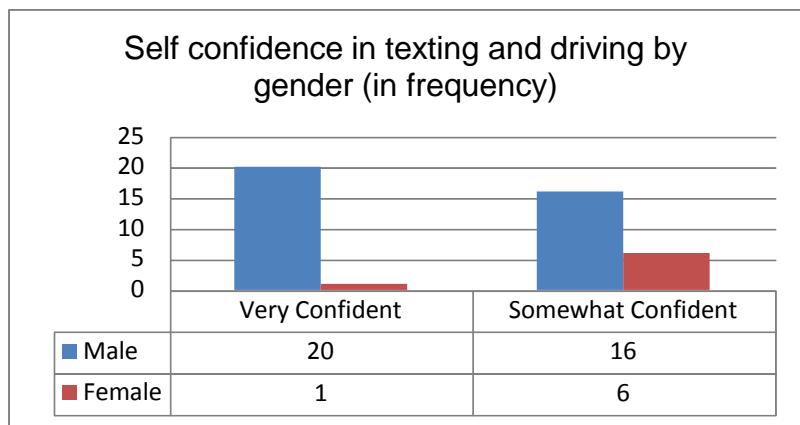
Although slightly more than half of the respondents claim to text and drive (sometimes), the majority of them (88%) acknowledged that they had seen drivers texting while driving. This finding raises two issues. Firstly, some of the respondents were conscious of their culpability hence the modest finding in claiming to text and drive. Secondly, with 88% of the drivers saying they had seen others driver text and drive, it revealed how prevalent this risky culture was. Nevertheless, only 50% of the participants in this study said that they had asked drivers to stop texting whilst driving. The study demonstrated that the other 50% of the survey participants did not request the respective drivers to stop texting and driving. Some of the reasons they gave were that they were afraid that the driver might be rude. They also justified their actions by saying that everyone was doing it or simply because they did it too. Some of the respondents provide the following examples by way of explanation.

- “I don’t ask them to stop texting because I also do it” (respondent no. 45)
- “I didn’t ask because I was afraid that they will tell me to get off” (respondent 5)
- “I was in a taxi and taxi drivers are rude” (respondent no. 66)
- “Everyone is doing it, therefore I don’t have a problem with it” (respondent no. 71)

The research showed that a few drivers do sometimes park their cars to attend to their mobile cell phones. The survey also showed also that only 4% of the drivers said they always stopped and park to send texts or make a phone call. Sixty-three percent said they did it sometimes whereas 33% said they never stopped and parked for that.

Examining how confident drivers think they are at texting and driving, the study revealed that 21% claimed they were very confident, 24% were not confident, while 20% were somewhat confident. Interestingly, male drivers were more confident that they can text while driving than were female drivers. See Figure 6.2.

Figure 6.2: Self confidence in texting and driving by gender



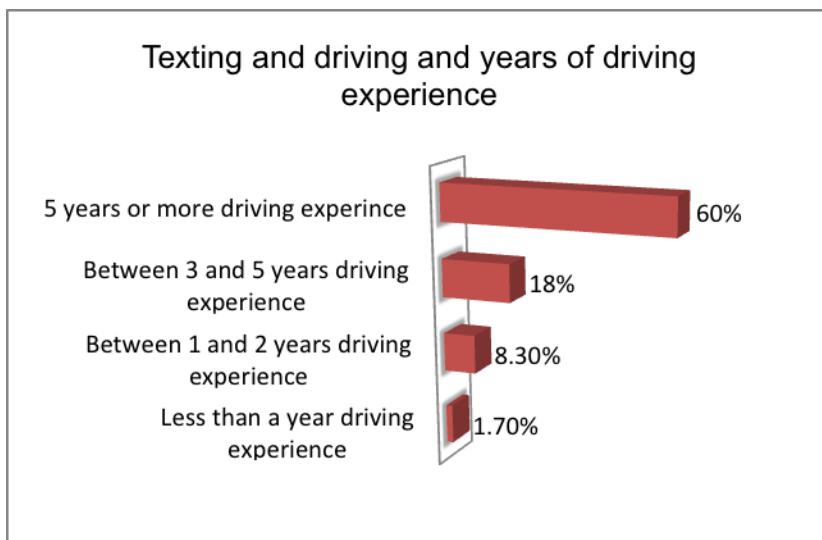
The prevalence of texting and driving was also proven through observation. During the observation, it was found that 13 out of 92 drivers were pressing their cell phones keypad while driving. This equates to 14.1% of drivers who were pressing the keypads on their phones while driving. Sixteen drivers were staring at their cell phone screen while driving. This means that 17.4% of drivers were looking at their cell phone screen while driving. Interestingly, the observation also showed that male drivers, press their cell phone keypad more often than do female drivers while driving. The observations showed that 8 male drivers had their fingers on their cell phone keypad while driving, whereas there were only 5 female drivers who had their fingers on their cell phone key pad while driving.

Interviews were conducted with two traffic officers from the Polokwane Municipality Department of Transport to get information from their experiences. The officers claimed that texting and driving was a habit. As a result, it became part of the activities that drivers do when they drive, such as changing gears. This means that people become used to it to the extent that they do it frequently and it is, as such, seen as a norm. The officers said texting and driving happened everywhere, on both short and long-distance drives. The law enforcers said that normally when they patrolled between Mankweng and Polokwane, out of every ten cars they saw, they found that at least four drivers were using their mobile cell phones to text. One traffic officer noted:

When drivers see us while they are using their cell phone while driving, they put down the phone and then apologise by gesture. After they have passed us, they continue using their mobile cell phone, meaning that they use cell phones as much as they want to in the absence of officers.

The survey data revealed that drivers with greater driving experience text more often than less-experienced drivers. The experience of drivers is measured by the number of years spent driving. Figure 6.3 clearly shows that less-experienced drivers do not text as much while driving. This means that more experienced drivers are most likely to text while driving. This could be based on the assumption that their experience based on years of driving, gives them the confidence to multi-task.

Figure 6.3: Texting and driving and years of driving experience



The research showed that drivers with less driving experience were not as confident nor were they as willing to text while driving, whereas experienced drivers claimed that they could confidently text while driving.

6.3 BIOMECHANICAL DISTRACTIONS (PHONE CALL AND DISTRACTED DRIVING AND TUNING RADIO)

Paying attention to a secondary activity while driving is considered to be distraction to the driver (NHTSA, 2013). According to The Royal Society for the Prevention of Accidents (RoSPA) in UK (2016) biomechanical distraction “occurs when a driver is doing something physical that is not related to driving, for example, reaching for something and be out of the driving position, or holding an item”. This could include making a phone call while driving or reaching out to the dashboard to tune the radio. Drivers tended to make phone more calls and talk on hand-held phones more while driving as compared to texting and driving. Survey data showed that there were more drivers who made more phone calls than texts while driving. Most of the drivers (80%) who participated in this study said that they had made a phone call with a hand-held phone while driving. In the same light, there were more drivers (85%) who answered phone calls with hand-held devices while driving.

Table 6.1: Phone call with hand-held cell phone while driving

Types of distractions	Percentage	
	Yes	No
Have you ever made a phone call with a hand-held cell phone while driving?	80.0	20.0
Have you ever answered a phone call with hand-held cell phone while driving?	85.0	15.0

The data continued to reveal that male drivers were the most distracted gender. The study showed that many more male drivers (65%) made phone calls with a hand-held cell phone than did female drivers (15%).

From the observations, out of 92 drivers observed, 22 drivers were talking on a handheld cell phone while driving. This equates to 23.9% of people observed talking on

a hand-held cell phone. The study revealed that the predominant race who made calls with hand-held cell phones were Black with a percentage of 32.7% (18 drivers). Only 14.3 % (four drivers) were White, No Coloured, Indians nor Asians were seen talking with hand-held cell phone during the observation.

From the interviews with traffic officers, the law enforcers said that their experiences of phone calls while driving was the same as that of texting while driving. However, the officers indicated that they saw more drivers who text compared to those who talk on a cell phone. The officers said that most of the drivers apologised when they were caught using their cell phone while driving. However, they continued after having passed the officers.

The traffic officers said that because they stand by the side of the road to stop moving vehicles, it was difficult to catch drivers who made phone calls. This was because when drivers approached them, they were able to hide their mobile cell phones. The officers indicated that when they were patrolling, they were able to spot most of the drivers making use of their cell phone while driving.

One of the officers noted:

When drivers notice that a traffic officer has seen them using their mobile cell phone, they drop it and pretend as if they were not busy with their cell phone. Others, however, would continue using the cell phone and explain to the traffic officer about the importance of the call whereas others would claim that they are looking for directions from the person on the other end of the line.

The other officer said:

Most of the time, when we catch drivers who talk on hand-held cell phones while driving, they always promise that it is the last time and that it shall never be repeated. This shows that most drivers know that it is against the law to talk on a hand-held cell phone but they ignorantly do it anyway. This calls for extreme measures to curb this problem.

Tuning a radio or tape can reduce ones level of concentration while driving (Arrive Alive, 2016). Hence, there are more advanced technological measures to address this problem like installing radio buttons on the steering wheel. During the observations, 12 drivers were noticed tuning their radio on the dashboard while driving. This accounted for 13 per cent of drivers tuning the radio while driving. Seven male drivers were noticed tuning their radios whereas only 5 female drivers were noticed tuning their radios. This clearly suggests that male drivers are the most distracted gender.

6.4 COGNITIVE DISTRACTION

Some studies show that there is a cognitive distraction which can occur while driving. Ranney et al (2001) support this by saying that cognitive distraction while driving transpires when the driver is responding to a ringing phone or making a call with the assistance of the vehicles' Bluetooth device.

Cognitive distraction ensues when the driver is lost in thought or is thinking about something not related to the driving activity. This cognitive distraction may be caused by technological devices such as making a phone call via Bluetooth. Strayer, Cooper, Turrill, Coleman, Medeiros-Ward and Biondi (2013) mention that inattentive blindness provides a clear measure of cognitive distraction since the driver's eyes are on the road and reactions tend to be slow. Inattentive blindness is loss of sight due to mental distraction or being lost in thought.

Although the Bluetooth phone call system was introduced as an approach to reduce hand-held phone calls, calls via Bluetooth can be distractive even though they may be a lesser distraction than that of a hand-held cell phone while driving. Strayer et al elucidate that Bluetooth phone calls can be distractive while driving because they are mentally demanding. Consequently, ones mind-set may shift from the driving activity to the conversation of the Bluetooth phone call.

The survey findings showed that 14% of the drivers said that they always used Bluetooth for phone calls while 46% said that they used Bluetooth sometimes, and 40% said that they never used it.

Measuring cognitive distraction through observation is challenging. In this study the researcher assessed this issue through critical observation whereby the researcher selectively identified drivers who seemed to be focused on a Bluetooth call. Drivers who seemed to express wide-ranging expressions were identified as being focused on the Bluetooth phone call such as laughing or clapping of their hands whilst driving.

During the observation nine drivers were seen talking on a cell phone using the Bluetooth device while driving. Interestingly, male drivers continue to dominate in all types of distractions. Six male drivers were seen talking on a cell phone using the Bluetooth device and only 3 female drivers were seen talking on a cell phone while making use of the Bluetooth device.

6.5 AUDITORY DISTRACTION

Auditory distraction while driving was also assessed during the survey. Auditory distraction occurs when there are sounds which can affect the driver's hearing. As a consequence the driver fails to pay full attention to driving because of the sound. Unal, de Waard, Epstude and Steg (2013) mention that music distraction is not just about fiddling with the volume of the media player but that the music itself can cause distractions while driving. Furthermore, Unal et al state that drivers appears to enjoy loud music yet in return it tends to distract them.

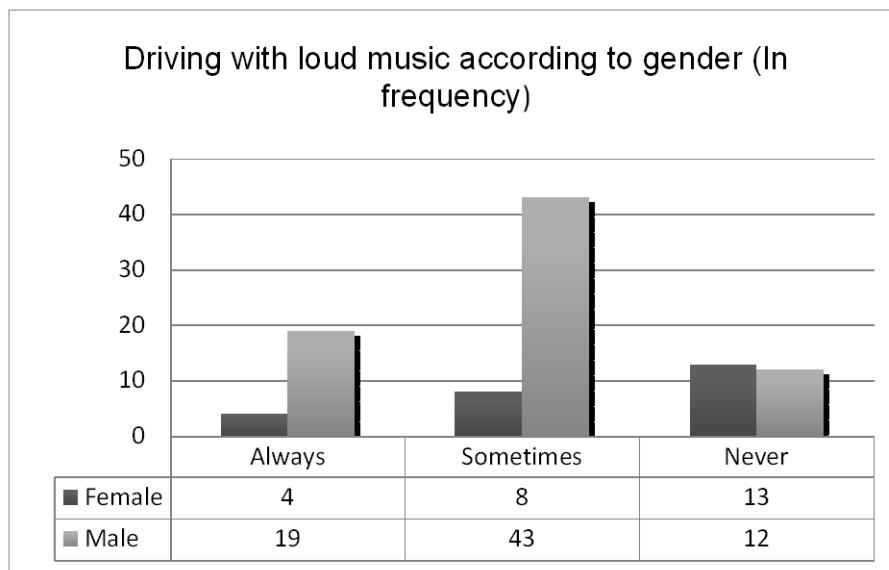
The survey showed that 24% of drivers claimed that they always drove with loud music and 51% drove with loud music sometimes. On the other hand, only 25% of the respondents claimed that they never drove with loud music.

The survey data showed that young adult drivers were the most distracted age group in terms of loud music with 69.6% of the respondents in the age group 22-29 years old saying that they always drove with loud music. None of the respondents in the age

group of 40 years or older always drove with loud music, although 7.8% of them said that they sometimes drove with loud music. This is a clear indication that young adults are the ones predominantly facing the challenge of auditory distraction.

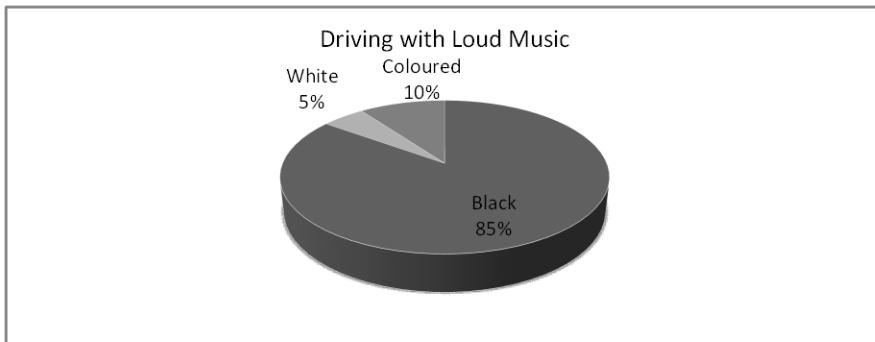
Pertaining to gender, more males were found to be distracted by loud music (See Figure 6.4).

Figure 6.4: Driving with loud music according to gender (In frequency)



From the observation, it was easy to identify drivers who might be affected by auditory distraction through the loudness of the sound. It was found that loud music was a noticeable technological distraction with a percentage rate of 21.7% (20 drivers) of drivers being observed driving with loud music (auditory distraction). Among the 20 drivers that were observed driving with loud music, 85% of those were blacks. There were no Indian or Asian observed driving with loud music. This is illustrated in figure 6.5 below:

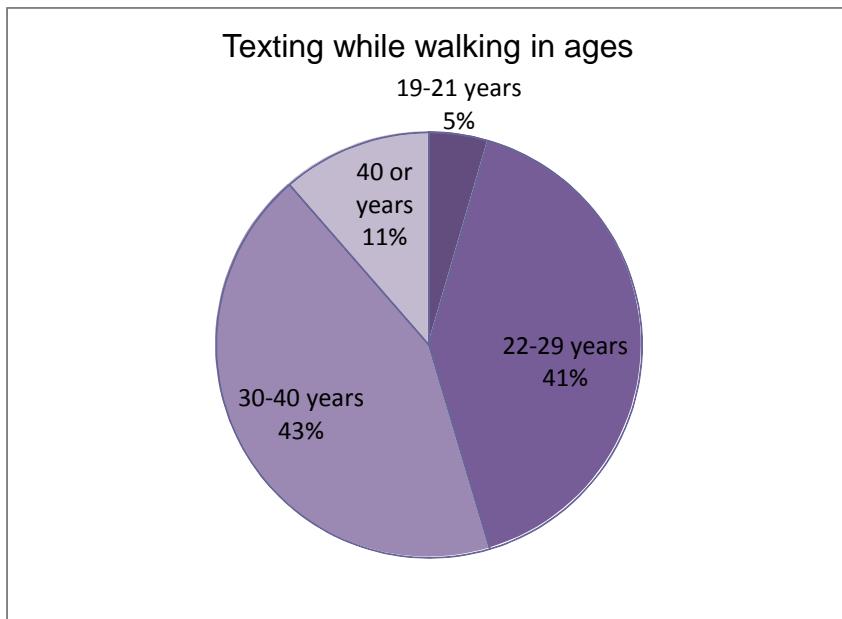
Figure 6.5: Driving with Loud Music



6.6 ALWAYS-AVAILABLE COMMUNICATION CULTURE AND DISTRACTION

One of the objectives of this study was to investigate the cultural and social impact of texting and mobility as a form of the always-available culture. This was investigated through a survey. The culture of texting anywhere at any time has penetrated our society. Almost all the respondents in the survey acknowledged that their cell phones were always in their possession. Interestingly, 84% of them claimed that they also text while walking. It is interesting that the respondents in the age group of 30 to 40 years text more while walking than do the other age groups. The figure below reflects the difference.

Figure 6.6: Texting while walking in ages



Technology and mobility have made it possible to text anywhere at any time. People can now communicate without boundaries. However, this may distract people while busy with other activities. The survey data showed that 44% of the respondents said that they text even when they are busy with other activities such as attending meetings, church or seminars.

It is interesting that 68.5% of drivers from the survey believed that the always-available culture was good for them, they explained that they liked the fact that they could be reached anywhere at any time through technology. Nevertheless, some drivers thought that being reached by text everywhere at any time was sometimes a good thing and sometimes not good because it might deter their focus. The drivers were asked what they thought about the fact that they could be reached by text message everywhere at any time. Below are some of the responses:

- “I think it is good that I can read messages every time anywhere because it might be an emergency. On the other side I think it is not good because text messages may distract you from rather serious activities.”
- “It depends on where you are and what you are busy with.”

- “I think it is good because I get to respond whenever I have time.”

6.7 CONCLUSION

This chapter presented findings of this research on the prevalence of technology use while driving. All data collected from the questionnaires, observations and interviews was presented according to themes. The findings reveal that technology use while driving prevails in South Africa. The next chapter is the presentation of data based on the impact of technology distraction.

CHAPTER 7

THE IMPACT AND AWARENESS OF THE DANGER OF TECHNOLOGY USE AND DISTRACTED DRIVING (DATA ANALYSIS & PRESENTATION)

7.1 INTRODUCTION

This chapter presents findings based on the data collected and analysed on the safety issues relating to texting and driving in South Africa. The previous chapter revealed that technological distractions are of significant prevalence amongst South African drivers. It was found that most South African drivers who participated in this study (76%) received and read a text message while driving. In all types of distractions, male drivers were the most distracted.

The previous chapter also revealed that traffic officers noted that texting and driving was a habit for most drivers, and it had become part of driving activity as much as changing of gears was. The survey revealed that drivers with less driving experience did not engage in texting while driving as much. This was attributed to the fact that they did not feel confident with texting and driving. Fascinatingly, 85% of the drivers said that they had answered a hand-held phone call while driving. This was the most prevalent technological distraction amongst the many others.

Interestingly, the previous chapter alluded to the fact that young adults are mostly distracted by technology while driving. The survey data showed that young adult drivers were the most distracted age group through playing loud music with 69.6% of the age group (22-29 year olds) who participated in this study saying that they always drove with music playing in the background.

The previous chapter revealed that 68.5% of South African drivers who participated in this study approved of the fact that they could be reached anywhere and at any time by means of technology. This shows that drivers could text or make a phone call while driving because they liked it. Interestingly, 84% agreed that they also text while walking. The survey revealed that the age group of 30 to 40 year olds texted more while walking than all the other age groups in this study.

In this way, this chapter presents findings about the awareness of technology use and the impact of technology use, in texting and driving. Tison et al (2011) assert that most drivers do not believe that texting while driving has a negative impact. However, 90% of passengers feel unsafe when drivers text and drive. The Road Traffic Management Corporation (RTMC) (2016) revealed that South African drivers spend 1.46% of their driving time on technological devices while driving. The study shows that experienced drivers spend 64 seconds on texting whereas less experienced drivers spend 21.2 seconds on texting while driving.

This chapter further presents the awareness of the dangers of technological distractions and driving. This chapter examines the knowledge of drivers about the danger of texting and driving. Arrive Alive (2016) shows that drivers need to understand that texting and driving is a serious risk just as is drinking and driving. Furthermore, Arrive Alive shows that texting and driving is much riskier than the influence of drugs and alcohol.

Stimpson and Wilson (2010) note that since 2005, texting volume appeared to have contributed to an alarming rise in distracted driving fatalities in the USA. Fatalities due to distracted driving increased by 28% after 2005, rising from 4 572 fatalities to 5 870 in 2008. Stimpson and Wilson (2010) further show that crashes increasingly involved male drivers, driving alone, who were in collisions with roadside obstructions in urban areas. Anderson, Burris, Ibrahim and Wagenaar (2011) reported that texting and driving distractions were identified as factors in 16% of all fatal crashes recorded in the Fatality Analysis Reporting System (FARS) in 2008 in the USA.

Recently, Arrive Alive has embarked on a campaign to alert South African drivers to the danger of texting while driving. Figure 7.1 shows how Arrive Alive uses banners to create awareness about the danger of texting and driving.

Figure 7.1: Arrive Alive banner for curbing texting while driving.



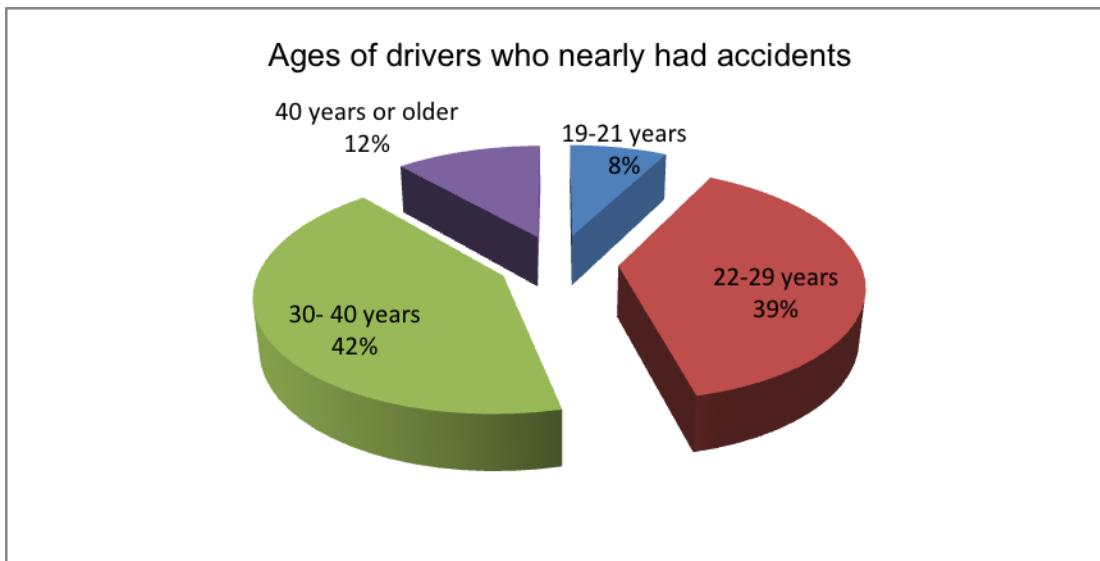
(Picture by: Arrive Alive)

7.2 THE IMPACT OF TECHNOLOGY USE, TEXTING AND DISTRACTED DRIVING WHILE DRIVING.

Part of the question in the survey for this study was designed to assess the impact which could emanate as a result of texting and driving. The survey reflected that 26% of drivers mentioned that they had nearly been involved in an accident as a result of texting and driving.

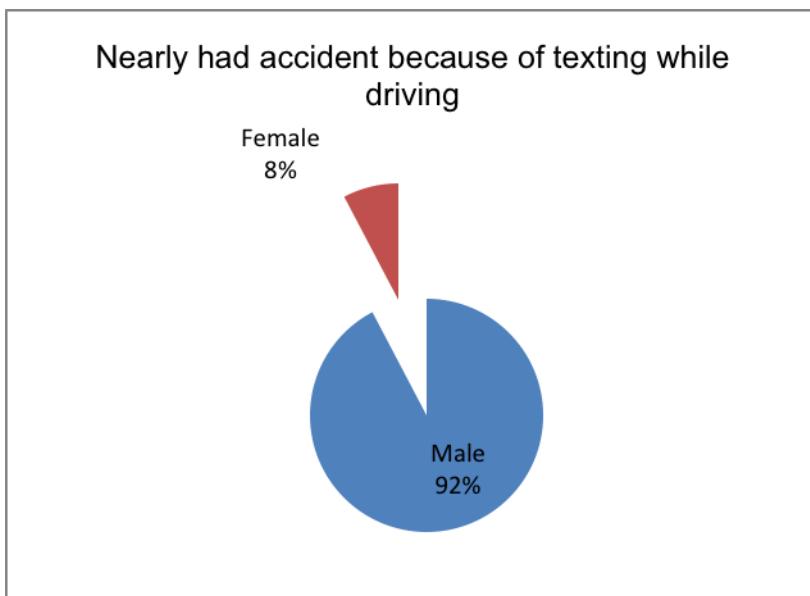
The age group of 30-40 year olds was the age group with the greatest number of people in this study who had nearly experienced accidents because of texting and driving with 42% of them saying so. The Figure 7.2 shows the difference in the age groups of drivers who had nearly had accidents because of texting while driving. From these 26% of drivers who stated in the survey that they had nearly had accident while driving.

Figure 7.2: Ages of drivers who nearly had accident due to texting while driving



Interestingly, the survey revealed that mostly male drivers were the ones who had nearly been involved in accidents because of texting and driving. The Figure 7.3 below shows the contrast of the gender of the 26% of those nearly involved in an accident because of texting while driving.

Figure 7.3: Gender of drivers who nearly had an accident because of texting while driving



The previous chapter reflected that most drivers (60%) who participated in this study sent texts while driving. However, only 3% reported that they had accidents because of texting while driving. Based on the great number of drivers who appear to text while driving, 3% is a low percentage. This could be because some drivers may not have felt comfortable about disclosing that they were responsible for accidents due to texting and driving.

This 3% of drivers who claim they had accidents because of texting while driving is based on self-reported data (survey) directly from the respondents. As a result drivers who participated in this study may have felt uncomfortable telling the truth about texting and their accident experience. This would be a limitation of the questionnaire.

Male drivers continue to dominate in terms of technological distractions while driving. Out of the three drivers who had had accidents because of texting and driving, two of them were male. It is interesting that those drivers who were involved in accidents while texting and driving were the ones with greater driving experience. The survey showed that out of the three, two of those who had accidents had driving experience of five or more years while one was a driver with three to five years of driving experience.

The previous chapter reflected that drivers with more greater experience text while driving. The survey showed that drivers with more driving experience (five or more years) were the drivers who were most likely to have accidents because of texting while driving. The survey showed too that 65.4 % of drivers with five or more years driving experience had nearly had car accidents due to texting and driving. This shows that even if one has greater driving experience, one can lose driving concentration as a result of texting while driving.

During the observations, the researcher identified drivers' behaviours that were influenced by the use of technology while driving. Different technological distractions led to different behaviours. Four drivers drove too fast while being distracted by technology. One driver was talking on a handheld cell phone and three were playing loud music. In this way, it is safe to assume that driving with loud music can influence a driver to drive too fast. This is perhaps caused by the fact that loud music excites people, therefore

their mood of excitement led them to drive fast. Cunningham (2015) says that loud music could distract drivers from hearing auditory cues around them such as hooters and sirens as well as visual signs. This could be a problem because drivers need to take note of these cues for safety purposes

The observations reflected that there were seven drivers who were technologically distracted and drove too slowly as a result. From the seven drivers, one driver was talking on a handheld cell phone, one was reading messages or other items, one was adjusting a radio and four were pressing on a cell phone key pad. This shows that drivers who press their cell phone keypad while driving are more likely to drive too slowly.

During the observations, three drivers who were technologically distracted drove across the central road dividing line. One driver was using a mobile cell phone key pad, one was reading messages or looking at a mobile cell phone screen and one was talking on a handheld cell phone. Therefore, from these findings it is safe to postulate that visual distractions while driving can lead drivers to cross the road dividing lines. There is thus a potential risk for road accidents.

Two drivers were seen passing red traffic lights because they were technologically distracted. One driver was playing loud music and one was talking on a cell phone with a wireless device. Findings from the observations also show that there were two drivers who delayed moving after traffic lights had changed. Interestingly, both were talking on a handheld cell phone.

The researcher conducted interviews with two traffic officers who shared their experiences about technology use, and the impact of texting and driving on South African roads. The officers said that texting or talking on mobile cell phones while driving reduces one's driving concentration therefore, there was a strong possibility that one might lose complete concentration, because of cell phone use. The officers noted that it was always important to remember that one did not drive alone on the road. Therefore, drivers should be alert all the times.

The officers further stated that when one was having a conversation with someone while driving, that person might reveal something that was not expect or something that was shocking. This could ultimately shift ones entire concentration from driving. Thus, this could also lead to one crossing a red traffic light and thereby causing an accident.

The officers said that texting and driving was very dangerous because it switched concentration from driving to texting. Hence, the driver might cause an accident at any time.

The officers admitted that it was difficult to identify if an accident had been caused by the use of a mobile cell phone or not. The officers further indicated that when they arrive at an accident scene, they try to establish how the accident occurred such as trying to identify if the driver had lost control and hit oncoming traffic. However, the traffic officers indicated that they would not know what caused the driver to lose control unless there was a passenger who could explain how the driver had lost control of the vehicle. One traffic officer said:

It is rare for drivers to admit that is their fault which caused the accident because they do not want to take responsibility. We always check with the driver to see if they are not in a critical condition; however it is very rare that a driver could admit that they were busy on their cell phone because that would mean they are responsible for the particular accident.

The survey reflected that only 3% of drivers who participated in this study claimed that they had had an accident because of texting and driving. This percentage is doubtful because as the traffic officer explained, it is rare that drivers would admit that they were texting while driving.

Both officers said they had never witnessed any accident that had occurred in front of them because of the use of a mobile device while driving. However they had seen a driver who nearly caused an accident because this person was busy texting and driving. The South African government appears to focus more on the “Don’t drink and Drive” campaign, one of the officers said:

Our government is of the idea that most of the accidents are caused by drinking and driving because it is traceable. Moreover, other offences are not easy to trace such as the use of a cell phone while driving and they cause many of accidents on the South African roads. In this way, the statistics of accidents caused by cell phone usage will not be as high as those of drinking and driving.

The officers indicated that South African law did not allow them to check cell phone activity of drivers when they arrived at accident scenes. Davis (2016) says that insurance companies can require cell phone data especially when a lawsuit has been filed in association with the accidents. This means that an insurance company will try to check cell phone activity at the time of the accidents and see if there are linked. Hesse (2016) say that "this depends on how your policy is worded and whether such an act is regarded by your insurer as a traffic violation, which would not normally result in the repudiation of a claim, and an act of gross negligence, which would". As a result, it is important that drivers should be aware of the consequences of texting and driving and this would include the issue of insurance claims.

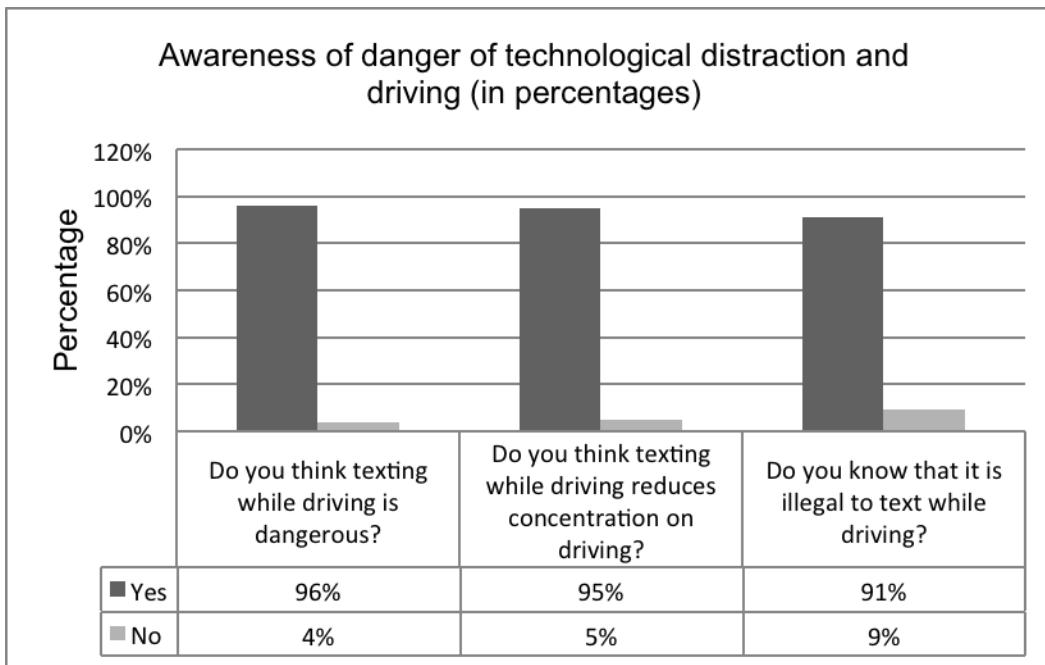
7.3 AWARENESS OF THE DANGER OF TECHNOLOGICAL DISTRACTION AND DRIVING

Most drivers know that texting while driving is dangerous but they still decide to text and drive. The survey showed that 96% of drivers believed that texting while driving was dangerous while 95% also believed that it reduced ones level of concentration while driving.

Only 9% of drivers who participated in this study were stopped by traffic officers because they were texting and driving. This shows that most South African drivers tend to hide their mobile cell phones when they see traffic officers. One of the major concerns that may arise here is how the behaviour of South African drivers can be

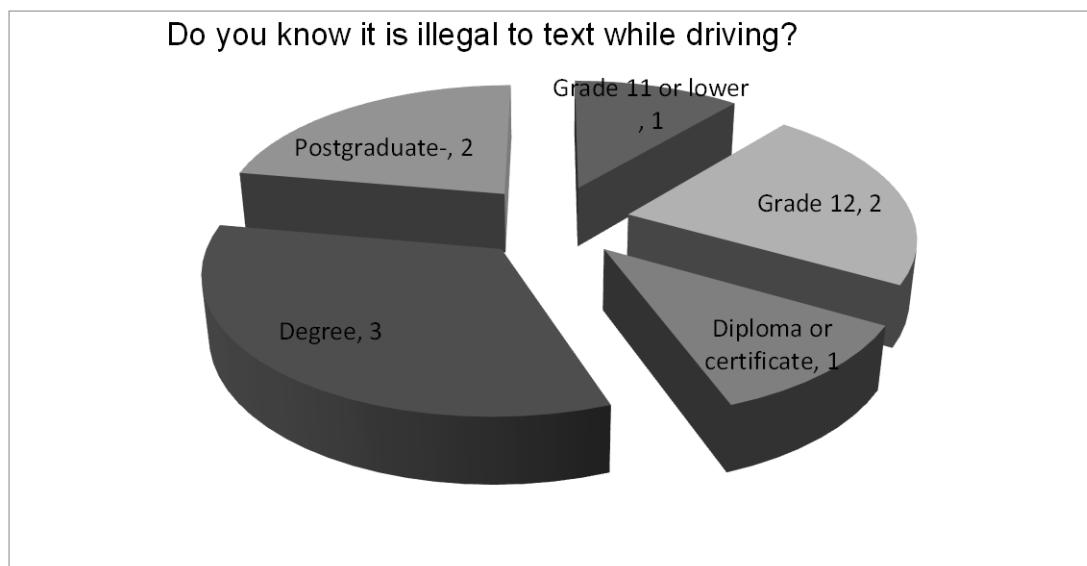
changed. Figure 7.4 shows the awareness of danger by the drivers who participated in the survey of this study (of the danger technological distractions and driving).

Figure 7.4: Awareness of danger of technological distraction and driving



The survey showed that 91% of drivers knew that it was illegal to text and drive. The education level of drivers who participated in this study seemed not to affect their knowledge about the illegality of texting and driving. From the 9% who did not know that it was illegal to text while driving, all education levels were present. The following figure (Figure 7.5) clearly shows the knowledge by drivers who participated in this study of the illegality of texting and related to their educational level.

Figure 7.5: Knowledge of illegality of texting and driving based on education levels (In Frequencies)



In the interviews conducted with the traffic officers, it was indicated that South African drivers lack information about technological distractions. The law enforcers said that some drivers did not know that it was illegal to use a mobile cell phone while driving. This showed that some drivers pretend that they did not know that texting while driving is illegal when they were caught by traffic officers because the survey showed that almost 91% of drivers knew that it was illegal to text while driving. In this way, it is safe to assume that drivers lie to law enforcers so that they do not get a ticket. One of the traffic officers said:

Most drivers do not know that having a cell phone in their hand while driving is against the law. Whether the cell phone is being used at that moment or not, it is illegal. Drivers get astonished when they are told that possession of a cell phone while driving is in fact breaking the law. The penalty for the use of a mobile cell phone is R1000. However, most drivers do not know about this. Hence they always think traffic officers are being unfair when they give them a ticket for that amount.

7.4 CONCLUSION

This chapter presented findings on the impact of technology use, texting and driving on the South African roads. The next chapter presents a summary of the conclusions and recommendations of the study.

CHAPTER 8

CONCLUSION AND RECOMMENDATIONS.

8.1 INTRODUCTION

The previous chapter discussed the impact and awareness of the danger of technology use and distracted driving. This chapter presents a summary of the research findings, conclusions, recommendations, as well as the contribution of the study, its limitations the study and concluding remarks.

8.2 RESEARCH DESIGN AND METHODS

A mixed methodology was used in this study to achieve the desired aim and objectives. A mixed methodology was used because it offers strengths that equalise the limitations of both qualitative and quantitative research. Survey, interviews and observations were used as research tools to address all objectives of this study. The research objectives of this research included the following:

- Explore the prevalence of distracted driving.
- Study the perceptions of drivers towards texting and driving.
- Investigate the cultural and social impact of texting and mobility.
- Discover ways of curbing texting and driving on South African roads.

In exploring the prevalence of distracted driving in South Africa, some questions from the survey focused specifically on that. Examples of survey questions are:

- Have you ever sent a text message while driving?
- Have you received and read a text message while driving?
- Have you ever made a phone call with a hand-held cell phone while driving?
- Do you drive with loud music?

These questions from the survey were useful in exploring the prevalence of distracted driving and the perceptions of drivers toward texting and driving were investigated through them. The questionnaires included questions such as “Do you think texting and driving is dangerous?” (See Appendix 1). Interviews were conducted with traffic officers to share their experience about the prevalence of distracted driving. Observations were also conducted to observe if South African drivers are technologically distracted while driving.

To investigate the cultural and social impact of texting and mobility, the survey and observations were useful research method in achieving this objective. Questionnaires had questions like “Have you NEARLY been in an accident because of texting and driving?” Moreover, observations included noting drivers who were technologically distracted while driving. To discover ways of curbing texting and driving on South African roads, the survey had a question where drivers were requested to give their opinion on how to curb texting and driving. Also, the interviews with the two traffic officers were conducted to collect opinions on how to curb texting and driving.

In this way, the mixed research methodology which was used in this study managed to meet all the objectives of this research.

8.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS.

This research has revealed that there is a prevalence of texting and driving on South African roads. It was found that 60% of drivers reported that they had sent a text while driving, whereas 40% of drivers claimed they had not. This clearly showed that most South African drivers from this study text while driving. This study also revealed that 76% of drivers reported that they read text messages while driving. Youth and technology are inseparable, thus this study showed that the youth were the most distracted drivers. The survey of this study indicated that 55% of drivers between the ages of 22 to 29 had sent text messages while driving. Moreover, 52.6% of the drivers

of the age group 22 to 29 years said that they had received and read text messages while driving.

Traffic officers also confirmed that when on duty, they saw drivers texting while driving. The traffic officers believed that texting while driving is common to the extent that it is part of the drivers' activities. The observations from this study also revealed that there was a prevalence of texting while driving. This research found that 13 out of 92 drivers were using their cell phone keypads while driving.

Making a phone call on a handheld cell phone and tuning a radio can be distractive because they are secondary activities while driving. Most of the drivers (80%) who participated in this study said that they had made a phone call with a handheld phone while driving. In the same light, there are more drivers (85%) who answered phone calls with hand-held devices while driving. From the observations, out of 92 drivers observed, 22 drivers were talking on handheld cell phone while driving. This equates to 23.9% of the people observed talking on a handheld cell phone.

Previous studies also support the findings of this study. Albany (2013) reported that in the USA a total of 298 road signs indicating Texting Zone had been installed to alert drivers about all 91 Texting Zone locations. This was because it has been found that there was about a 365% increase in the number of tickets issued in 2013 when compared to 2012. Crocket (2014) contends that texting while driving can reduce brake reduction by 18%, thus when the driver delays to brake; it ultimately causes accidents. This confirms what previous studies have observed as the danger of texting and driving. Harrison (2011) revealed that college students often engage in sexting and argument while driving, thus distractions may result.

Auditory distraction was also investigated in this study and the survey revealed that 24% of drivers who participated in this study claimed that they always drove with loud music while 51% drove with loud music sometimes, whereas, on the other hand, only 25% of the respondents claimed that they never drove with loud music. The observations showed that loud music is a noticeable technological distraction with a

percentage rate of 21.7% (20 drivers) being observed driving with loud music (auditory distraction). This confirms the findings of a study by Brodsky and Slor (2013) which revealed that loud music may lead to driver miscalculations and inaccuracies, violations, and aggressive driving.

Technology usage has grown rapidly and it is now part of life. Many people in society rely on technology, such as the cell phone, to communicate at anytime and anywhere to reach everywhere. This has thus led the so-called always-available culture. This means that one can be reached any time even when one is busy with other activities such as driving. Consequently, this sometimes becomes a problem because it causes distractions.

The survey data showed that 44% of the respondents said that they text even when they are busy with other activities such as attending meetings, church or seminars. This attests to the always-on communication culture. However, 68.5% of the drivers who participated in this study claimed that the always-available communication culture is good for them. They explained that they liked the fact that they could be reached anywhere at any time through technology. The always-available communication culture includes variations resulting from the culture of family and from the traditional approaches to socialisation prevalent in society.

This research has proven that technology use while driving has a negative impact on driving activity. The survey reflected that 26% of drivers claimed that they were nearly involved in an accident as a result of texting and driving. Only 3% of drivers who participated in this study claimed that they had had an accident because of texting while driving. The officers interviewed in this study felt that drivers did not want to take responsibility for accidents, therefore, they did not disclose this information. As a result of this, factual data may be difficult to collect.

Stimpson and Wilson (2010) would have concurred with this research as they reflected that from 2005, texting volume appeared to be contributing to a disturbing rise in distracted driving fatalities. Fatalities due to distracted driving increased 28% after 2005, rising from 4 572 fatalities to 5 870 in 2008 in the USA. Furthermore, the study by

Densu and Salifu (2014) in Ghana observed 9 868 drivers, of whom 2.6% were using mobile cell phones. The use of a mobile cell phone while driving was significantly linked with front-seat occupancy, time of day and vehicle type characteristics (Densu and Salifu, 2014).

Male drivers are the most distracted gender across all types of distractions. This may be because male drivers claimed that they feel confident that they can text while driving. Twenty per cent of the male drivers who participated in this study said that they were very confident that they could text and drive whereas only 1% of female drivers said that they were very confident. Chemi and Fahey (2015) showed that men are the most distracted gender. When answering a call from their important other (such as family, colleagues), 48% of men would picked up. However, only 39% of women pick up (Chemi and Fahey, 2015).

The awareness of the danger of technological distractions and driving has not been emphasised in South Africa. The Arrive Alive road safety initiative has recently been focusing on other road safety campaigns such as 'Don't drink and Drive'. This research has revealed that most of the drivers (91) who participated in this study knew that it was illegal to text while driving. Ninety-six per cent of drivers believed that texting while driving was dangerous while 95% also believed that it reduced ones level of concentration while driving. However, this does not mean that these drivers understand how dangerous it is to text while driving. In this way, South African drivers might take the issue of texting while driving as being trouble-free because there is less emphasis on it. The traffic officers argued that South African drivers lack information about technological distractions.

This research substantiates technological determinism and the unintended consequences of technology, as well as the dystopian view of technological determinism which states that advantages of technology come together with disadvantages. In this way, the manner in which people use technology may affect them negatively, such as cell phone usage while driving. Therefore, it is important to alert society to the dangers of technology.

8.4 CONCLUSION

Technology has become part of our daily lives. People want to be reached anywhere at any time and this can be a distraction. Hence, the always-available communication culture was born. This study revealed that there is a prevalence of technology usage in South Africa with negative implications linked to distracted driving. The use of technology while driving is a distraction and it may lead to road accidents. Because of this, technological distraction should not be taken for granted. The confidence level of drivers with extensive driving experience is a problem because they are the ones who mostly text while driving.

Visual distraction, auditory distraction, biomechanical distraction and cognitive distraction are the aspects of technological distraction that may affect people. In this way, it is important that the state educates the nation about the dangers of technology use, texting and distracted driving. The perception of drivers towards texting and driving should be changed to be viewed as a problem.

8.5 RECOMMENDATIONS

There are different methods which could be used to curb technology use while driving. This section presents strategies which could be applied to reduce distracted driving.

8.5.1 Recommendation from previous studies

Many researchers have shown that young drivers are the most distracted drivers. In the USA, the Governors Highway Safety Association (GHSA) (2010) lists the following strategies used in the USA:

- Distracted driving has emerged as a priority for State Highway Safety Offices (SHSOs). In this way, most states have indicated that distracted driving is integrated in their strategic highway safety plans (SHSPs).

- States have improved data collection efforts on distracted driving. This means that more research should be done on distracted driving.
- Focus on educating novice drivers about distracted driving. Information access to novice drivers about distracted driving should flow easily. Driver License Manuals should be updated.
- There should be more emphasis on education efforts. Thirty-seven states and the capital Washington D.C. indicated that they have public information/education campaigns on distracted driving.
- Usage of new technology to educate drivers about distracted driving. Social media campaigns should be created to emphasise the dangers of distracted driving.
- Passing of laws to address distracted driving. The law should state the penalties of technology use (texting and handheld phone call) while driving.
- There should be an increase in Public/Private Partnerships. States should focus on creating relationship amongst stakeholders such as Government, business commuters, technology manufactures, car manufactures, research institutions, and drivers to develop policies and initiatives to address distracted driving.
- Usage of roadside signs for alerting drivers to stop texting while driving.

An International Conference on Distracted Driving (2006) postulates that supportive efforts amongst government, the research community and the industry should be emphasised for information accuracy, reach and penetration in the society. Moreover, it suggests that employers should be encouraged to adopt policies for employees to decrease potential driving distractions. It further suggests that these should include:

Technologies supplied as original and aftermarket equipment as well as portable electronic devices used in vehicles; study effects on specific high-risk groups, such as novice drivers and older drivers; work hand-in-hand with manufacturers of the technology products and the industries that incorporate them in their own products to be able to react quickly to rapidly-moving technology research, development, and implementation;

and consider both the cumulative effects and the interactive effects of multiple technological or telemetric devices (2006:08).

Fedeli (2016) shows that in Canada (Ontario) there is a new bill on texting and driving which enforces the idea of a texting zone. Fedeli (2016: para 2) explains texting zone as “*an area where a driver is able to park or stop safely to use a hand-held wireless communication device*”. Fedeli (2016) shows that according to Bill 190 of Canada, it states:

1. The Highway Traffic Act is amended by adding the following section:

Highways designated for texting zones

151.1 (1) The Minister may by regulation designate any part of the King's Highway where the shoulder of the highway may be used as a texting zone.

Texting zone

(2) A texting zone is an area where a driver of a motor vehicle is able to park or stop safely for the purpose of using a hand-held wireless communication device or a device that is prescribed for the purposes of subsection 78.1 (1).

Same

(3) The Minister may make regulations,

(a) regulating the use of texting zones and prescribing conditions and circumstances for that use, including prescribing rules governing the use of signals and four-way flashers, exemptions from any requirement of this Part or in a regulation made under this Part applicable to the use of texting zones and conditions and circumstances for such exemptions;

(b) providing for the erection of signs and the placing of markings,

(i) on any highway approaching any part of a highway designated as having a shoulder that may be used as a texting zone, and

(ii) on any part of a highway designated as having a shoulder that may be used as a texting zone;

- (c) prescribing the types of the signs and markings referred to in clause
- (b) instructions to be contained on them and the location of each type of sign and marking

Hence, it is also important that South Africa learns from what other countries have done with legislature in order to address texting and driving.

8.5.2 Recommendations from data collected in this study.

Drivers who participated in this study were asked how technology use could be reduced while driving. Most of the respondents highlighted that a network jammer should be installed in moving vehicles to freeze the driver's network. In this way, the jammer should be linked to the driver's cell phone to jam only the drivers network. Other respondents focused on the matter of a penalty and that the penalty for technology use while driving should be increased. For example respondent no. 68 said:

I think our government should increase the penalty fee so that drivers can understand how serious this matter is.

Some of the drivers who participated in this study believed there should be more campaigns about distracted driving in South Africa. In this way, a campaign about texting and driving should be given as much priority as the 'Don't Drink and Drive' campaigns.

The traffic officers suggested that having more traffic officers on the road that will patrol could help because drivers currently dodge traffic officers who park alongside the road. At times, drivers on the road also indicate to each other that traffic officers are ahead so that they may stop doing anything that is illegal. One of the officers stated that:

We should have a law which enables traffic officers to check the last communications on a cell phone when they arrive at accident scenes.

This means that the time of accident will be checked in line with the last communication on a mobile cell phone to see whether it corresponds.

The traffic officers further indicated that the learners drivers' license syllabus that is currently used in South Africa is outdated. It does not have the most current rules of the road. An officer state that:

We need a learners drivers licence syllabus which will be relevant to the current generation whereby the issue of texting and driving is also addressed, hence people do not have information about some of road rules. People do not think that the use of a mobile cell phone while driving is a big issue.

The officers said that there were several methods which were being used by government to inform people about road rules, such as Imbizo, public participation, Arrive Alive and other programmes which were used to inform drivers. However, the officers said that there was little emphasis on the amount which should be charged for road offences. Thus, the officers would always have conflict with drivers when they give them a penalty ticket to pay. Drivers know the offences but they do not know the amount for those offences. One traffic officer stated that:

Our government should educate people about the dangers of texting while driving. Moreover, the law enforcement on texting and driving should be strengthened; therefore traffic officers should make sure that a penalty is given to every driver that is found texting while driving. Traffic officers should leave behind the tendency of letting drivers go without a penalty when they are found texting while driving.

Lastly, the traffic officers supported the idea of installing devices in every car which would jam the network of the driver's cell phone when the car is in motion. The implementation of this recommendation could play a crucial role in curbing technology use while driving.

8.5.3 Discussion of recommendations and researcher's view

An epidemic cannot have solutions unless it is identified as a major problem. Therefore, it is important that the always-available communication culture (such as texting while driving) also be viewed as a problematic phenomenon. In this way, there should be more research on distracted driving so that there will be more suggestion on how to curb technology use while driving. Education about technological distractions is of paramount importance in this era. People tend to overlook the negative impact which comes with technology. It is important that the South African government initiate campaigns which will educate people about the dangers of texting and driving.

Usage of both traditional media and new media should be adopted to reach the target population. However, it is important that social media campaigns be strengthened. This is because much research, including this study, has proved that youth tend to text more while driving. Consequently, the youth and social media are inseparable.

Moreover, it is important that cell phone manufacturers, government, vehicle manufacturers, network service providers, commuter organisations such as the South African Taxi Council, learning institutions and stakeholders at all levels (Insurance companies, Road Accident Fund, RTMC, etc.) come together to develop strategies to curb technology use while driving.

The education system in South Africa from primary level to tertiary level should have programmes which educate students about this matter. In this way, the knowledge about the danger of texting and driving will be recognised from an early age. As a result, the awareness about the negative impact that comes with the always available culture will be acknowledged.

8.6 CONTRIBUTIONS OF THE STUDY.

There is little research on technology use, texting and distracted driving in South Africa. Hence this study will contribute to the academic literature in the field of communication

because the impact of technology use while driving was explored. In this way, the knowledge on the impact of technology use, texting and distracted driving accumulates.

This study is of paramount importance for society and its institutions because it provides knowledge about the impact of technology use while driving. This study provides strategies which could be used to reduce road accidents which occur on South African roads due to technological distractions.

8.7 LIMITATIONS OF THE STUDY

The study use one province and a small sample, therefore the results of this study may not be generalised to represent all drivers in South Africa. Furthermore, the observation location for this study was in Limpopo Province with majorly black drivers and, therefore, reports based on race may be compromised. This means that generalisability of the findings may be limited to the population of the Limpopo Province.

More male drivers participated in this study, therefore, reports based on gender may be under-reported. Reports of accidents caused by technology use while driving may be compromised because drivers do not want to take responsibility for the accidents. The traffic officers interviewed in this study supported this statement by saying that drivers never agree that they were accountable for car accidents.

It is important to acknowledge that if anyone died because of texting and driving, that person would not have been available to take part in this study. Therefore, the consequences of technology use and texting while driving may be under-reported.

A major challenge which the researcher faced during the collection of data was that some of the drivers could not read and understand the English language. Therefore, the researcher had to translate into the Sepedi Language and explain each question. This also means that the researcher had to listen to their responses which were in Sepedi, and translate into English. This might have affected their responses.

8.7 CONCLUDING REMARKS

This study has proven that there is high prevalence of technology use, texting and distracted driving in South Africa. It was revealed that technology use, texting and driving can cause accidents. However, there is a paucity of research on technology use, texting and distracted driving. Therefore, it is of paramount importance to have more research on this epidemic and to come up with possible solutions towards decreasing the number of accidents associated with distracted driving.

The always-available communication culture which prevails in society with both negative and positive consequences should then be recognised. In other words, a balanced approach (which acknowledges the negative and positive consequences of the always-available communication culture) should be followed to come up with solutions for distracted driving.

REFERENCE LIST

Abeele, M.V, Antheunis, M.L & Schouten, A.P. 2013. Me, myself and my mobile: A segmentation of youths based on their attitudes towards the mobile phone as a status instrument. *Telematics and Informatics*. 31(1): 194–208.

Adler, P. 2006. Technological Determinism. The *International Encyclopedia of Organization Studies*. Sage. <http://www-bcf.usc.edu/~padler/> (accessed 06-05-2015).

Albany, N, Y. 2013. *Governor Cuomo Unveils "Texting Zones" along NYS thruway and highways for drivers to pull over and use their cell phones*. New York State.

<https://www.governor.ny.gov/news/governor-cuomo-unveils-texting-zones-along-nys-thruway-and-highways-drivers-pull-over-and-use> (accessed 29-08-2015).

Anderson, E.D, Burris, S.C, Ibrahim, J.K & Wagenaar, A.C .2011. State Laws Restricting Driver Use of Mobile Communications Devices Distracted-Driving Provisions, 1992–2010, *American Journal of Preventive Medicine*. 40 (6): 659–665.

Anderson, J & Rainie, L. 2010. *The Future of social Relations*. Pew Research Center. <http://www.pewinternet.org/2010/07/02/the-future-of-social-relations-2/> (accessed 06-05-2015).

Angelopulo, G & Barker, G. 2013. *Integrated Organisational Communication*, 2nd edition, Cape Town: Juta.

Arrive Alive. 2015. *Accidents Statistics*. <https://www.arrivealive.co.za/stats.aspx> (accessed 22-05-2015).

Arrive Alive. 2016. *Texting and Distracted Driving*. <https://arrivealive.co.za/Texting-and-Distracted-Driving> (accessed: 20-04-2016).

Atchley, P, Atwood, S & Boulton, A. 2010. The choice to text and drive in younger drivers: Behavior may shape attitude. *Accident Analysis and Prevention*, 43(1): 134–142.

Automobile Association of South Africa. 2015. Demonstration: Distracted Driving: <http://www.aa.co.za/about/press-room/commentary/distracted-driving-demonstration.html> (accessed 04-02-2015).

Balogun, S.K, Monteiro N, Pheko M.M & Tlhano K.N. 2013. Kiss of death: distracted driving related behaviours among drivers in Botswana. *Asian Journal of Social Science And Humanities*. 2 (3): 120-128.

Battard, N & Mangematin, V. 2012. Idiosyncratic distances: Impact of mobile technology practices on role segmentation and integration. *Technological Forecasting and Social Change*. 80 (2): 231-242.

Bester, G & Brand, L. 2013. The effect of technology on learner attention and achievement in the classroom. *South African Journal of Education*. 33 (2): 1-14.

Bimber, B. 1990. Karl Max and the Three Faces of Technological Determinism. *Social Studies of Science*. Massachusetts Institute of Technology. 20(2): 2-22.

Bless, C, Smith, C.H & Sithole, S.L. 2013. *Fundamentals of research methods: An African perspective*. 5th edition. Cape Town: Juta.

Blumenfeld, P, Fishman, B,J, Krajcik, J, & Marx, R,W. 2000. Creating usable innovations in systemic reform: Scaling up technology-embedded project based science in urban schools. *Educational Psychologist*, 35(3): 149-164.

Braun, V & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2): 77-101.

Britz, J.J. 1996. *Technology as threat to privacy: Ethical Challenges to the Information Profession*. University of Pretoria <http://web.simmons.edu/~chen/nit/NIT%2796/96-025-Bitz.html> (accessed 29-05-2015).

Brodsky, W, & Slor, Z. 2013. Background music as a risk factor for distraction among young-novice drivers. *Accident Analysis & Prevention*, 59(1): 382-393.

Buchanan, J, Friedrich, L & Purcell, K. 2013. *The Impact of Digital Tools on Student Writing and How Writing is Taught in Schools*. Pew Research Centre: <http://pewinternet.org/Reports/2013/Teachers-technology-and-writing> (accessed 25-02-2015).

Buchanan, J, Chen, C, Friedrich, L, Jacklin, A, Heaps, A, Purcell, K, Rainie, L & Zickuhr, K. 2012. *Part II: The Mixed Impact of Digital Technologies on Student Research*. Pew Research Centre. <http://www.pewinternet.org/2012/11/01/part-ii-the-mixed-impact-of-digital-technologies-on-student-research/> (accessed 17-03-2015).

Carr & Carr Attorneys at Law. 2015. *Bill outlawing texting while driving signed by Oklahoma governor*. <http://www.carrcarr.com/bill-outlawing-texting-while-driving-signed-by-oklahoma-governor/> (accessed 28-08-2015).

Carr, N. 2008. *Is Google Making Us Stupid? What the Internet is doing to our brains*. <http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/306868/> (accessed: 26-01-2016).

Carr, N. 2010. *The Shallows. What the Internet Is Doing to Our Brains*. New York, London: W.W. Norton & Company.

Carroll, J., Howard, S., Peck, J., & Murphy, J. 2002. A field study of perceptions and use of mobile telephones by 16 to 22 year olds. *Journal of Information Technology Theory and Practice*, 4(2): 49–61.

Carroll, L. 2014. Texting while walking: The dangerous traffic trend for teens. Today Parents: <http://www.today.com/parents/texting-while-walking-dangerous-traffic-trend-teens-2D80183599> (accessed 21-02-2015).

Cassidy, S. 2006. Using social identity to explore the link between a decline in adolescent smoking and an increase in mobile phone use. *Health Education*, 3(106): 238–250.

Chemi, E & Fahey, M. 2015. *Men and women are lying about their texting-and-driving*. CNBC. <http://www.cnbc.com/2015/04/07/men-and-women-are-lying-about-their-texting-and-driving.html> (accessed 22-06-2016)

Creswell, J. 2008. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. 3rd edition. Upper Saddle River, NJ: Pearson Education.

Crocket, J. 2014. *Statistics highlight the dangers of texting and driving*. Western Cape Government. <http://www.polity.org.za/article/statistics-highlight-the-dangers-of-texting-and-driving-2014-06-10> (accessed 23-08-2015).

Crosswhite, J,M, Rice, D & Asay, S,M. 2014. Texting among United States young adults: An exploratory study on texting and its use within families. *The Social Science Journal*, 51(1): 71-78.

Cunningham, T. 2015. *Effects of Listening to Loud Music While Driving* <http://www.newsplex.com/home/headlines/Affects-of-Listening-to-Loud-Music-While-Driving--294342191.html> (accessed 20-06-2016).

Davis, C. 2016. Am I Required To Give My Cell Phone Records To The Insurance Company After A Car Accident? <http://www.injurytriallawyer.com/faqs/am-i-required-to-give-my-cell-phone-records-to-the-insurance-company-after-a-car-accident.cfm> (accessed 20-06-2016).

DeLoatch, P. 2015. *The four negative sides of technology*. Edudemic <http://www.edudemic.com/the-4-negative-side-effects-of-technology/> (accessed 25-06-2015).

Densu, S.N & Salifu, M. 2014. Distracted Driving: Cellular Phone use among Motorists in the Sekondi-Takoradi Metropolis, Ghana. *Civil and Environmental Research*: 6. (4):21-28.

Deresiewicz, W. 2009. *The End of Solitude*. The Chronicle of Higher Education. <http://chronicle.com/article/The-End-of-Solitude/3708> (accessed 30-05-2015).

Dingus, T.A, Guo, F, Klauer, S.G, Lee, S.E, Ouimet, MC & Simons-Morton, BG. 2014. Distracted Driving and Risk of Road Crashes among Novice and Experienced Drivers. *The New England Journal of Medicine*. 370(1): 54-59.

Discovery Insure. 2015. *Texting and Driving: Time To Get Real*.

<https://www.discovery.co.za/portal/individual/insurance-news-aug14-driving-with-cellphones> (accessed 04-02-2015).

Du Plooy-Cilliers, F, Davis, C & Bezuidenhout, R. 2014. *Research Matters*. 2nd edition, Cape Town: Juta.

Effective Measure. 2014. *South African Mobile Report. A Survey of Desktop User's Attitudes and Uses of Mobile Phone*. www.effectivemeasure.com/south-african-mobile-report-march-2014 (accessed 18-02-2015).

eNCA. 2016. *Easter Road Accidents and Death Toll Stats Released*.

<http://www.enca.com/south-africa/catch-it-live-easter-road-accidents-and-death-toll-stats-released> (accessed 08-04-2016).

Fedeli, V. 2016. *Bill 19 - An Act Governing The Designation and Use Of Texting Zones*. http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&Intranet=&BillID=4135 (accessed 22-06-2016).

Forgays ,D.K, Hyman, I & Schreiber, J. 2013. Texting everywhere for everything: Gender and age differences in cell phone etiquette and use. *Computers in Human Behavior*, 31(1): 314–321.

Gareffa, P. 2013. *Will Texting Zones be the fix for distracted driving?* Edmunds <http://www.edmunds.com/car-news/will-texting-zones-be-the-fix-for-distracted-driving.html> (accessed 20-04-2016).

Gates, S. 2012. *Texting While Walking Ban: Fort Lee Imposes \$85 Fines On Dangerous Texters [Corrections]*. Huffington Post.

<http://www.huffingtonpost.com/2012/05/14/texting-while-walkingbann1514308.html> (accessed 02-05-2015).

Geerstsema, S, Hyman, C, & Van Deventer, C. 2011. Short message service (SMS) language and written language skills: educators' perspectives. *South African Journal of Education*. 31(4):475-487.

Goggin, G. 2004. 'Mobile text' M/C: A Journal of Media and Culture, 7
<http://www.media-culture.org.au/0401/03-goggin.php> (accessed 21-02-2015).

Goldman, E.G. 2015. Surviving the Distraction Epidemic. *Huffpost Heath Living*.
http://www.huffingtonpost.com/ellen-g-goldman/surviving-the-distraction_b_6455404.html (accesses 25-02-2015).

Governors Highway Safety Association. 2010. *New Report Shows States Increasing Efforts on Distracted Driving*.

http://www.ghsa.org/html/media/pressreleases/2010/20100615_distraction.html
(accessed 06- 06-2016).

Harrison, M.A. 2011. College students' prevalence and perceptions of text messaging while driving. *Accident Analysis and Prevention*. 43(1): 1516–1520.

Harwood, J, Dooley J. J, Scott, A.J & Joiner, R. 2014. Constantly connected – The effects of smart-devices on mental health. *Computer In Human Behavior*, 34(1): 267–272.

Haste, H. 2005. Joined-up texting: mobile phones and young people. *Young Consumers*, 6 (3): 56–67.

Heaney, J. 2015. *Impact of Technology on Privacy*. Study.Com
<http://study.com/academy/lesson/impact-of-technology-on-privacy.html> (accessed 30-05-2015).

Hesketh, B. 2001. *International Encyclopedia of the social behavioural sciences*. Smelser,N, J & Baltes, P,B,(eds). Technological Determinism. Lincoln. Anybook Ltd: 15495-15597.

Hesse, M. 2016. *Using a cellphone while driving may hurt your pocket*. IOL
<http://www.iol.co.za/business/personal-finance/using-a-cellphone-while-driving-may-hurt-your-pocket-2016022> (accessed 16-05-2016).

Hetland, P. 2012. Internet between Utopia & Dystopia: The narratives of control. *Nordicom Review*, 33(2): 3-15.

Horrey, W.J, Lesch M.F & Garabet A. 2007. Assessing the awareness of performance decrements in distracted drivers. *Accident Analysis and Prevention*. 40(1): 675–682

Hosale, S. 2013. *25 Negative of impact technology*. Roogirl. <http://roogirl.com/25-negative-effects-of-technology/> (accessed 29-06-2015).

Howcroft, D & Fitzgerald, B. 1998. Utopia and Dystopia: The Twin Faces of the Internet, in Larsen, T and Levine, L. (Eds.) *Information Systems: Current Issues and Future Changes, Proceedings of IFIP WG8.2 and WG8.6 Joint Conference*, Helsinki, Finland, December, Chapman & Hall: 49-70.

International Conference on Distracted Driving .2006. Summary of Proceedings and Recommendations. *The Traffic Injury Research Foundation and The Canadian Automobile Association*.

Keen, A. 2007. *The Cult of the amateur. How today's internet is killing our culture*. Double Day, New York.

Kemp, S. 2015. *Digital, social & mobile in 2015*. We are Social.
<https://www.slideshare.net/wearesocialsg/digital-social-mobile-in-2015/download>
(accessed: 28-09-2015).

Klauer, S.G, Guo, F, Simon-Morton, B.G, Ouimet, M.C, Lee, M.C, & Dingus, T.A. 2014. Distracted driving and risk of road crashes among novice and experienced drivers. *The New England Journal of Medicine*. 370(1): 54- 59

Kling, R. 1996. *Hopes and Horrors: Technological Utopianism and Anti-Utopianism in Narratives of Computerization*. 2nd Edition. San Diego: Academic Press: 42.

Knopf, A. A. 1996. Why Things Bite Back: Technology & The Revenge of Unintended Consequences by Edward Tenner.

www.gordonconwell.edu/ockenga/TennerE.WhyThingsBiteBack.pdf (accessed: 20-01-2016).

KPMG. 2011. Cyber crime – A growing challenge for government. *Issues Monitor*, 8.

<http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/cyber-crime.pdf> (accessed 29-06-2015).

Lamberg, E. M & Muratori L. M. 2011. Cell phones change the way we walk. *Gait & Posture*. 35(1): 688–690.

Leedy, P.D & Ormrod, J.E. 2013. *Practical research: Planning and Design*. 10th edition. USA: Pearson.

Levy, S. 2014. Texting While Walking Causes More Accidents Than Texting and Driving. *Health Line*: <http://www.healthline.com/health-news/tech-texting-while-walking-causes-accidents-031014> (accessed 21-02-2015).

Longnecker E. 2014. *Cities consider laws banning texting and walking*. 13 WTHR <http://www.wthr.com/story/18403886/cities-consider-laws-banning-texting-and-walking> (accessed 05-05-2015).

Madden, M & Lenhart, A. 2009. *Teens and Distracted Driving: Texting, talking and other uses of the cell phone behind the wheel*, Pew Internet Research & American Life Project. Washington, D.C.

Mathews, R. 2004. The psychosocial aspects of mobile phone use amongst adolescents. *In Psych*, 26 (6): 16–19.

Matyszczyk, C. 2015. *Two women, desperate for original selfie, carve initials into Rome's Colosseum*. CNET. <http://www.cnet.com/news/two-women-desperate-for-original-selfie-carve-initials-into-romes-colosseum/> (accessed 2015-03-17).

McFarlane, D.A. 2010. Social communication in a technology-driven society: a philosophical exploration of factor-impacts and consequences. *American Communication Journal*, 12(1): 1-13.

McLaughlin, S.B, Owens, J.M & Sudweeks, J. 2010. Driver performance while text messaging using handheld and in-vehicle systems, *Accident Analysis and Prevention*, 43(1): 939–947.

McLuhan, M. 1969. *Technological Determinism*. Playboy Magazine.
<https://masscommtheory.com/theory-overviews/technological-determinism/> (accessed 23-04-2015)

McNamee, D. 2014 "Technology Addiction' - How Should It Be Treated?". *Medical News Today*. <http://www.medicalnewstoday.com/articles/278530.php> (accessed 20-05-2015).

McWhorter, J. 2013. *Is Texting Killing the English Language?* Time:
<http://ideas.time.com/2013/04/25/is-texting-killing-the-english-language> (accessed 21-02-2015).

Merton, R.K. 1936. The unintended consequences of purposive social action. *American Sociological Association*. 1 (6): 894-904.

Mogg, T. 2012. *Accidents involving headphones – wearing pedestrian on the rise*. Digital Trends: <http://www.digitaltrends.com/music/accidents-involving-headphone-wearing-pedestrians-on-the-rise/> (accessed 21-02-2015).

Muvuringi, M.P. 2012. Road traffic accidents in Zimbabwe, influencing factors impact and strategies. *International course in health development*, 1(2):205-219.

Naimi, L.L & French, R.M. 2009. The Unintended Consequences of Technological Innovation: Bluetooth Technology and Cultural Change. *The IPSI BgD Transactions on Internet Research* . 6(2):3–13.

National Highway Traffic Safety Administration (NHTSA). 2012. *Traffic Safety Facts: Pedestrians*. Washington (DC): <http://www.nrd.nhtsa.dot.gov/Pubs/811888.pdf> (accessed 11-05-2015).

National Highway Traffic Safety Administration. 2013:
<http://www.nrd.nhtsa.dot.gov/Pubs/811737.pdf>. (accessed 30-03-2015)

Nworie, J & Haughton, N. 2008. The unintended consequences of the application of technology in teaching and learning environments. *TechTrends*, 52(5): 52-57.

Oksman, V & Turtiainen, J. 2004. Mobile communication as a social stage. *New Media and Society*, 6 (3): 319–339.

Olumami, H.O, Ojo, T.K & Mireku D.K. 2014. Perceiving risk of automobile drivers on mobile phone usage while driving in Ibadan Metropolis, Nigeria. *Business Excellence and Management*: 4(3):24-35.

Ossip, A. 2014. Texting while driving one of the greatest dangers on South African roads. Discovery. <http://www.fanews.co.za/article/short-term-insurance/15/motor/1023/texting-while-driving-one-of-the-greatest-dangers-on-south-african-roads/16518> (accessed 29-08-2015).

Pannabecker, J.R. 1991. Technological Impacts and Determinism in Technology Education: Alternate Metaphors from Social Constructivism. *Journal Of Education*: 3 (1):1-11.

Papadakis, S. 2009. *Technological convergence: Opportunities and Challenges*. <https://www.itu.int/osg/spu/youngminds/2007/essays/PapadakisSteliosYM207pdf> (accessed 30-05-2016).

Park, W.K. 2005. Mobile Phone Addiction. *Computer Supported Cooperative Work*, 31(3): 253-272.

Pearsall, J & Hanks, P .2001. *New Oxford Dictionary of English*. Oxford University.

Petroviak, H. 2015. *Technology becoming a distraction in the classroom*. WTHITV.
<http://wthity.com/2015/01/20/technology-becoming-a-distraction-in-the-classroom/>
(accessed 27-05-2015).

Postman, N. 1998. *Five Things we need to know about technological change*. Speech given in Denver Corolado, 27 March 1998.

Purcell, K & Rainie, L. 2014. *Technology's impact on workers*. Pew Research Centre.
<http://www.pewinternet.org/files/2014/12/PIWeb25WorkTech12.30.141.pdf> (accessed 17-03-2015).

Purcell, K, Buchanan, J, and Friedrich, L. 2013. *The Impact of Tools on Student Writing and How Writing is Taught in Schools*. Pew Research Center.
<http://www.pewinternet.org/2013/07/16/the-impact-of-digital-tools-on-student-writing-and-how-writing-is-taught-in-schools/> (accessed 29-05-2015).

Ranney, T.A, Garrott, W.R & Goodman, M.J . 2001. *NHTSA Driver Distraction Research: Past, Present, and Future*. Washington DC: NHTSA Research and Development, 233(1): 1-9.

Road Traffic Management Corporation. 2011. *Road Traffic Report 31 March 2011*. Department of Transport.
<https://www.arrivealive.co.za/documents/march%202011%20road%20traffic%20report.pdf> (accessed 26-07-2015)

Road Traffic Management Corporation. 2016. *Inattentive and Distracted Driving*. Department of Transport.
http://www.rtmc.co.za/images/docs/Traffic%20Reports/Traffic_Report_JantoMarch2016.pdf (accessed 06-08-2015)

Rogers, E.M. 2003. *Diffusion of Innovations*. New York: Free Press.

Rosenbaum, M. 2013. *How Hard Is It to Pay Attention?* Huffing Post:
<http://www.huffingtonpost.com/murray-rosenbaum/technology-distractionsb4398694.html> (accessed 20-02-2015).

Salazar-Acosta, M & Holbrook, A. 2008. *Some notes on theories of technology, society and innovation systems for science and technology policy studies*. Centre For Policy Research On Science And Technology Simon, 8(2): 1-48.

Salehan, M & Negahban, A. 2013. Social networking on smartphones: When mobile phones become addictive. *Computer in Human Behavior*, 29(1):2632–2639.

Schwartz, K. 2013. *Age of Distraction: Why It's Crucial for Students to Learn to Focus*. Mind. <http://blogs.kqed.org/mindshift/2013/12/age-of-distraction-why-its-crucial-for-students-to-learn-to-focus/> (accessed 21-02-2015).

Schwebel, D.C, Stavrinos, D, Byington, K.W, Davis, T, O'Neal, & de Jong D. 2011. Distraction and pedestrian safety: How talking on the Phone, texting and listening to music impact crossing the street. *Accident Analysis and Prevention*. 45(1):266–271

Siski, D.W. 1997. *Transformations of Language in Modern Dystopias*. Connecticut: Greenwood Press.

South African Radio League. 2006. *Road Traffic Ordinance Regulation 308A Prohibition on use of communication device while driving*.

[http://www.sarl.org.za/public/licences/Mobile Communications Road Traffic Ordinance 308A 01 2006.pdf](http://www.sarl.org.za/public/licences/Mobile%20Communications%20Road%20Traffic%20Ordinance%20308A%2001%202006.pdf) (accessed 21-04-2018)

Spencer, B. 2014. *Texting while driving 'slows reaction times more than drink or drugs'*. Daily Mail: <http://www.dailymail.co.uk/news/article-2652015/Texting-driving-slows-reaction-times-drink-drugs.html> (accessed-02-09-2015).

Statistics South Africa. 2015. *How much do South Africans spend on ICT?*: www.statssa.gov.za/?p=4414 (accessed: 28-09-2015).

Stimpson, J.P & Wilson, F.A. 2010. Trends in Fatalities From Distracted Driving in the United States, 1999 to 2008. *American Journal of Public Health* 100 (11):2213-2219

Strayer, D.L, Cooper, J.M, Turrill,J, Coleman,J, Medeiros-Ward, N & Biondi, F. 2013. *Measuring Cognitive Distraction in the Automobile*. AAA Foundation for Traffic Safety. University of Utah.

Tan, Ç, Pamuk, M & Dönder, A. 2013. Loneliness and Mobile Phone. 13th Internation Education Technology Conference. *Procedia - Social and Behavioral Sciences*. 103 (1): 606 -611.

Texting Thumb Bands. 2015. *Driving While Intexticated: Teens and Adults texting behind the wheel:* <http://www.textinganddrivingsafety.com/texting-and-driving-stats/> (accessed 04-02-2015).

Thatcher, A. 2005. Defining the South African internet ‘addict’: Prevalence and biographical profiling of problematic internet users in South Africa. *South African Journal of Psychology*. 35 (4):766-792.

The Royal Society for the Prevention of Accidents. 2016. *Driver Distraction Fact Sheet*. <http://www.rospa.com/road-safety/advice/drivers/distraction/fact-sheet/> (accessed 22-04-2016).

The South African Radio League. 2006. www.sarl.org.za (accessed 22-05-2015).

Tison, J, Chaudhary, Nc & Cosgrove, L. 2011. *National phone survey on distracted driving attitudes and behaviors*. (Report No. DOT HS 811 555). Washington, DC: National Highway Traffic Safety Administration:1-104 .

Toda, M, Monden, K, Kubo, K, & Morimoto, K. 2006. Mobile phone dependence and health-related lifestyle of university students. *Social Behavior and Personality: An International Journal*, 34 (10):1277–1284.

Unal, A.B, de Waard, D, Epstude, K, Steg, L. 2013. Driving with music: Effects on arousal and performance. *Transportation Research Part F: Traffic Psychology and Behaviour*. 21(1):52-65.

Walsh, S.P, White, K.M, Cox S & Young, R.S, 2010. Keeping in constant touch: The predictors of young Australians’ mobile phone involvement. *Computer in Human Behaviour*. pp. 333–342.

Watt, H. J. 2010. How does the use of modern communication technology influence language and literacy? A review. *Contemporary Issues In Communication Science and Disorder*. 37(1):141-148.

Webster, C. 2011. *What is Cyberbullying?*

http://www.cyberbullying.info/resources/downloads/ChrisWebster_WhatIsCyberbullying.pdf (accessed 29-06-2015).

Western Cape Transport and Public Works. 2015. *Western Cape Transport on dangers of distracted driving*. <http://www.gov.za/speeches/safely-home-and-vodacom-join-forces-highlight-dangers-distracted-driving-27-may-2015-0000> (accessed 28-08-2015).

Writer, S. 2013. *SA students addicted to social media: research*. My Broadband. <http://mybroadband.co.za/news/internet/90771-sa-students-addicted-to-social-media-research.html> (accessed 07-05-2015).

Zehner, O. 2012. *Unintended Consequences of Green Technologies*. Green Illusions: The Dirty Secrets of Clean Energy and the Future of Environmentalism. University of Nebraska Press: Lincoln and London.

Zickuhr, K. 2011. *Generations and their gadgets*. Pew Research Center: <http://pewinternet.org/Reports/2011/Generations-and-gadgets.aspx> (accessed 25-02-2015).

APPENDIX 1: QUESTIONNAIRE

Respondent no.....

My name is Kgasago Tshepho, Masters Student in the Department of Communication Studies at the University of Limpopo. I am conducting research about "*Technology use Texting, and Distracted Driving in South Africa*" for academic purposes. Your participation in this study will be highly appreciated. Your identity as a respondent will remain anonymous.

Instructions

Please answer the questionnaire as honestly as possible.

Use a cross (X) to answer the questions where appropriate.

Section A

1. Have you ever sent a text message while driving?

- (a) Yes ()
(b) No ()

2. Have you received and read a text message while driving?

- (a) Yes ()
(b) No ()

3. Have you ever made a phone call with a hand-held cell phone while driving?

- (a) Yes ()
(b) No ()

4. Have you ever answered a phone call with a hand-held cell phone while driving?

- (a) Yes ()
(b) No ()

5. How often do you text and drive?

- (a) Always ()
(b) Sometimes ()
(c) Never ()

6. Have you ever talked on the phone with a wireless device (Bluetooth) while driving?

- (a) Always ()
(b) Sometimes ()
(c) Never ()

7. Have you NEARLY been in an accident because you were texting and driving?

- (a) Yes ()
(b) No ()

8. Have you been involved in an accident because you were texting and driving?

- (a) Yes ()
(b) No ()

9. Have you ever been in a vehicle as a passenger while the driver was holding a cell phone to make or receive a call?

- (a) Yes ()
(b) No ()

10. Have you ever been in a vehicle as a passenger where the driver was texting or reading a text message while driving?

- (a) Yes ()
(b) No ()

11. As a passenger, have you ever asked a driver to stop texting or stop reading a text message while driving?

- (a) Yes ()
(b) No ()

12. If your answer above is 'No', why?

13. If you text while driving, when or where do you text?

- (a) Never ()
(b) While driving on long distances ()
(c) While driving on short distances ()
(d) While driving on a minimum traffic road ()
(e) While waiting on traffic lights ()
(f) Everywhere ()

14. Have you ever stopped driving and parked on the side of the road to text or make a phone call?

- (a) Always ()

- (b) Sometimes ()
- (c) Never ()

15. Do you drive with loud music?

- (a) Always ()
- (b) Sometimes ()
- (c) Never ()

Section B

16. Do you think texting while driving is dangerous?

- (a) Yes ()
- (b) No ()

17. How confident are you that you can text and drive?

- (a) Very confident ()
- (b) Not confident ()
- (c) Somewhat confident ()
- (d) I don't text and drive ()

18. Do you think texting while driving reduces concentration on driving?

- (a) Yes ()
- (b) No ()

Section C

19. Do you take your mobile cell phone with you almost everywhere you go?

- (a) Yes ()
(b) No ()

20. Do you text while walking?

- (a) Yes ()
(b) No ()

21. Do you text while you are busy with any activity such as attending a meeting, a seminar or at a religious event (such as a church)?

- (a) Yes ()
(b) No ()

22. What do you think about the fact that you can be reached by a text message everywhere and at every time?

- (a) Disturbing ()
(b) Its good because you can communicate ()
(c) Others
-
-

23. If you are a student, have you ever texted during lectures?

- (a) Yes ()
(b) No ()

Section D

24. Do you know that it is illegal to text while driving?

- (a) Yes ()
(b) No ()

25. Have you ever been stopped by a traffic officer while texting and driving?

- (a) Yes ()
(b) No ()

26. What do you think should be done to stop people from texting while they are driving?

Section E

27. Sex

- (a) Female ()
(b) Male ()

28. Age

- (a) 16-18 years ()
- (b) 19-21 years ()
- (c) 22-29 years ()
- (d) 30-40 years ()
- (e) 40 years or older ()

29. Highest education qualification achieved.

- (a) Grade 11 or lower ()
- (b) Grade 12 ()
- (c) Diploma or certificate ()
- (d) Degree ()
- (e) Post-Graduate Degree ()

30. How long have you been driving?

- (a) Less than a year ()
- (b) Between 1 and 2 years ()
- (c) Between 3 to 5 years ()
- (d) Between 5 and more years ()

APPENDIX 2: OBSERVATION GUIDE

Date:

Start Time:

End Time.....

Venue:

Types of Technological distractions	Gender		Race				Remarks
	Male	Female	Black	White	Coloured	Indian/Asian	
Pressing a phone key pad (texting or dialling a number)							
Reading messages or other items on a phone screen (Visual Distraction)							
Talking on a hand-held Phone (Biomechanical Distraction)							
Talking on the phone with a wireless device- e.g. Bluetooth) (Cognitive							

Distraction)						
Adjusting Radio (Biomechanical Distraction)						
Loud Music (Auditory distraction)						
Others						

APPENDIX 3: INTERVIEW GUIDE

1. Tell me about your experiences about drivers who text and drive?
2. What are your views about drivers who talk on handheld cell phones while driving?
3. Can you describe your experiences of accidents caused by texting while driving?
4. Can you describe your understanding of accidents caused by talking on handheld cell phones while driving?
5. Can you explain the reaction of drivers who are caught texting while driving?
6. What is your experience of drivers who are caught talking on handheld cell phones while driving?
7. In your opinion, what do you think government should do to stop people from texting while driving?
8. In your view, what do you think government should do to stop people from talking on cell phones while driving?

APPENDIX 4: INTERVIEW RESPONSES

Traffic officer 1

Tell me about your experience of drivers who text and drive?

I believe texting or talking on mobile cell while driving contributes to reduction of concentration on driving; therefore there is high chance that you might lose complete concentration from driving to cell phone. It is always important to remember that you do not drive alone on the road; therefore it is important to be alert all the time. Moreover, when you are having conversation with someone while, they might tell you something you did not expect or shocking which can ultimately shift your entire concentration on driving. This could also lead to one crossing a closed traffic lights and cause accidents.

Tell me about your experience of drivers who make phone calls on handheld devices while driving?

The experience is the same of texting while driving.

Have you seen any accidents caused by the use of cell phones?

It is difficult identify if the accident was caused by the use of cell phone or not. When we arrive at accident scene, we try to establish how the accident occurred such identifying that the driver lost control and hit the upcoming traffic. However, we would not know what caused the driver to lose control unless there is passenger that can explain how the driver lost control. It is rare for drivers to admit that is their fault which caused the accident because they do not want to take responsibility.

Do you sometimes ask drivers what could have made them lose control?

As traffic officers, we always do check with the driver if they are not in critical condition; however it is very rare that the driver could admit that there were busy with their cell phone because that would mean they are the reason for the accident.

Can you explain the reaction of drivers who are caught texting while driving?

The problem is that we stand by the side of the road to stop moving vehicles; it is difficult to catch people who are using cell phone while driving. This is because when they approach us they are able to hide their mobile cell phone. When we are patrolling, we are able to spot most of drivers who use their cell phone while driving. When drivers notice that the traffic officer has seen them using mobile cell phone, they drop it and pretend they were not busy with the cell phone. Others, however, would continue using the cell phone and explain to us about how important the call is whereas others claim that they are looking for directions. The penalty for use of mobile cell phone is R 1 000, however, most drivers do not know about this. Hence they always think traffic officers are being unfair when they give them a ticket of that amount.

In your opinion, what do you think government should do to stop people from texting while driving?

I think having more traffic officers on the road that will patrol on the road could help because drivers now simply dodge traffic officers that park aside the road. At times, drivers also indicate to each that traffic officers are ahead so that they could stop doing anything that is illegal. The moving violation could better be seen when driving, thus when there are more traffic officer on the road, such norms could be minimised. I suggest that we should have a law that enables us to check last communication on cell phone when we arrive at accidents scenes. This means that the time of accident will be checked in line with the last communication on a cell phone to see if it does not correspond.

In your view, what do you think government should do to stop people from talking on cell phones while driving?

The major problem is that most South African drivers do not know that the use of mobile cell phone while driving is illegal. This could be because the learner's drivers' license syllabus which is currently used in South Africa is outdated; it does not have most of current rules of the road. I think we need learners' drivers' license syllabus which will be relevant to todays' era whereby the issue of texting and driving is also addressed,

hence people do not have information about some of road rules. People do not think that the use of mobile cell phone while texting is a big issue.

It seems as if our government has placed the emphasis more on the campaign “Don’t drink and drive” than on other offences. What is your take on this one?

I think our government think most of accidents are caused by drinking and driving because it is traceable. Moreover, other offences are not easy to trace such as the use of cell phone while driving and they cause lot of accidents on South African roads. In this way, the statistics of accidents caused by cell phone usage will not be high as drinking and driving.

Is there any form of communication which the government use to inform drivers about rules and regulation of South African roads when there are some developments?

There are several methods which are being used to inform people about road rules, such as imbizo, public participation, Arrive Alive and other programs. However, there is little emphasis on the penalty amount which is charged for road offences; therefore the officers always have conflict with drivers when they give them penalty ticket to pay. Hence they know the offences but they do not know the amount for those offences.

Traffic officer 2

Tell me about your experiences of drivers who text and drive?

I think texting and driving is a habit, as a result it becomes part of activities that driver do when they drive such as changing gear. This means that people become used to it to an extent that they do it every time they drive. Texting and driving do happen everywhere, in short and long distance drive. Normally when we patrol between Mankweng and Polokwane, out of ten cars we see, we can find that at least four drivers use their mobile cell phone to text or make a phone call while driving. When drivers see us while they are using cell phone while driving, they usually put down their cell phone and then apologise by gesture. After they have passed the traffic officers, they continue using

their mobile cell phone, meaning that they use cell phone as much as they want in absence of officers.

Tell me your experience of drivers who make phone calls on handheld devices while driving?

I think the experience is the same as the one of texting while driving. However, I often see more people texting as compared to those are talking on a cell phone.

Have you seen any accidents caused by the use of cell phones?

I have never seen any accident happening in front of me because of the use of mobile while driving; however I have seen drivers who nearly caused accidents because they were busy texting.

Can you explain the reaction of drivers who are caught texting while driving?

Most of The drivers apologise and then continue after they have passed the officers, on the other hand, most drivers do not know that by having cell phone in your hand while driving is against the law, whether the cell phone is being used at that moment or not. Drivers get astonished when they are being told that possession of cell phone while driving is illegal.

In your opinion, what do you think government should do to stop people from texting while driving?

I think the government should educate people about the danger of texting while driving. Secondly, law enforcement on texting and driving should be strengthened; hence traffic officers should make sure that penalty is given to every driver that is found texting while driving without any compromise. Thirdly, we should have devices in cars which jam the network of cell phone of drivers when the car is in motion.

In your view, what do you think government should do to stop people from talking on cell phones while driving?

Same strategies for curbing texting and driving should also be used for handheld phone calls while driving.