MULTIMEDIA-BASED ROAD SAFETY EDUCATION AND DRIVING BEHAVIOUR AMONG INTERSTATE COMMERCIAL MINI-BUS DRIVERS IN IBADAN METROPOLIS, NIGERIA

BY

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ABSTRACT

Risky driving behaviour among inter-state commercial mini-bus drivers in Ibadan metropolis is on the increase despite governments' commitment to stem the tide. It has negative social and health consequences. Previous studies have focused more on publicity campaigns, causes, effects and prevention of road traffic accidents with little emphasis on multimedia-based safety education interventions. This study was, therefore, designed to examine the effects of Multimedia-based Road Safety Education (MbRSE) on knowledge of and attitude to Safe Driving Behaviour (SDB) among inter-state commercial mini-bus drivers in Ibadan metropolis, Nigeria. The moderating effects of Educational Attainment (EA) and Driving Experience (DE) were also examined.

The study adopted Bandura's Social Cognitive Theory, while the pretest-posttest control group quasi-experimental design with 2x2x3 factorial matrix was used. Two motor parks (Iwo-Road - control and Ojoo - MbRSE), with multi-stop routes, were purposively selected. Seventy-eight drivers, with road safety records of risky driving behaviour and who scored 18 and above in the driving experience screening, were purposively selected from the two motor parks. The parks were randomly assigned to MbRSE (41) and control (37) groups. Treatment lasted eight weeks. The SDB Knowledge Test (r=0.62), and SDB Attitude (r=0.64) and DE (r=0.67) rating scales were used for data collection. Data were analysed using descriptive statistics, Analysis of covariance and Scheffe post-hoc test at 0.05 level of significance.

Majority (61.1%) of the drivers were between the ages of 26 and 41 years, 57.7% had no formal education, 18.0% attended driving schools, while 83.3% indicated ownership of vehicle. Treatment had significant main effects on attitude to ($F_{(1.67)}$=71.77; partial η^2=0.63) and knowledge ($F_{(1.67)}$=67.3; partial η^2=0.56) of SDB. Participants in the MbRE had Post Treatment Improvement (PTI) on their attitude ($\bar{x}$=56.67) than those in the control group ($\bar{x}$ = 36.93), while the participants in the MbRSE had PTI in their knowledge ($\bar{x}$=35.75) than those in the control group ($\bar{x}$=15.85). The EA had significant main effects on attitude ($F_{(1,67)}$=4.93; partial η^2=0.35) and knowledge ($F_{(1.67)}$=2.32; partial η^2= 0.12). Literate participants had a better PTI on their attitude ($\bar{x}$= 56.60) than the non-literate counterparts ($\bar{x}$=38.54), while the literate participants had a better PTI in their knowledge ($\bar{x}$ =34.25) than the non-literate counterparts ($\bar{x}$=18.50). The DE had significant main effects on knowledge ($F_{(2,67)}$=24.64; partial η^2=0.19) and attitude ($F_{(2,67)}$=3.43; partial η^2=0.28). Participants with high DE had better PTI in their knowledge ($\bar{x}$=35.01) than those with moderate ($\bar{x}$ = 22.09) and low ($\bar{x}$=13.37), while the participants with high DE had a better PTI on their attitude ($\bar{x}$=55.40) than those with moderate ($\bar{x}$=45.69) and low ($\bar{x}$ = 37.57). There were no significant two-way and three-way interaction effects.

Multimedia-based road safety education enhanced the knowledge of and attitude to safe driving behaviour among inter-state commercial mini-bus drivers in Ibadan metropolis. Interventions targeted at changing driving behaviour of commercial drivers, particularly those with no formal education and low driving experiences should be based on the use of multimedia.

Keywords: Multimedia-based road safety education, Safe driving behaviour, Inter-state commercial mini-bus drivers

Word count: 486

CERTIFICATION

I certify that this study was carried out by Emmanuel Dahunsi MABAYOJE (Matric. No. 99110) of the Department of Adult Education, University of Ibadan, Ibadan, Nigeria, under my supervision.

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DEDICATION

This research is dedicated to my brother and mentor, Professor Moses Olufunminiyi Mabayoje.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Transport is essential to the daily living all over the world. Without transport, exchange of commodities, people and ideas cannot take place and economies cannot grow (National Bureau of Statistics NBS, 2007). Nonetheless, the existence of an effective modern transport system can open many doors and bring about development (NBS, 2012). Undoubtedly, the benefits of motorisation come with a price which is characterised by extremely high and rapidly rising traffic accidents that have taken a wider dimension, most especially in countries like Nigeria – a developing country.

Road traffic accident (RTA) is a worldwide problem which has recorded with millions of injuries and deaths. Morbidity and death from road traffic in African continent is on the increase with overwhelming economy. The cost and consequences of road traffic deaths are enormous. The annual economic brunt of road traffic accident on the world's economy is about $500 billion. Out of this figure, the economic loss of the developing countries is estimated to be in the range of 1.5 to 2 % of their Gross Domestic Product (GDP) that is nearly $100 billion (World Health Organization {WHO}, 2011). This may be one of the factors responsible for poverty in developing countries. For example, in Nigeria, 3 billion Naira is lost to road traffic accidents every year, and the road traffic accidents cost 13 percent of Nigeria's Gross National Product (GNP) (Labinjo, Julliad, Kobusingye and Hyder, 2010).

This loss undoubtedly is a causal factor of the socio-economic underdevelopment of Nigeria. Morbidity and mortality induced by injuries from road crashes contribute significantly to human suffering (Labinjo, et al, 2009). Most of the victims belong to the class of youths, bringing in many years of either lost or threatened life of severe disability. This also is very high among the young adults that constitute the work force, and who are usually the bread winners in many cultures. This trouble brings huge economic suffering owing to the death of family breadwinners (WHO, 2011). Furthermore, the losses have significantly negatively impacted three-quarters of all poor families who have lost, at least, a member to road traffic death. (Silcok, 2003). Road crashes have led many innocent children to become direct victims of road crashes, posing on them harsh social conditions (Ipingbemi, 2008).

The causes of road traffic accidents (RTAs) in Nigeria, in particular, and sub-Saharan Africa, in general, are multi-factorial, including driver-related factors, vehicle, and roadway. A combination of the three factors can also cause accidents. Those factors that have to do with drivers put in about 57% of RTAs and 93% either alone or in addition with other factors (Adogu, Ilika and Asuzu, 2009). The driver-related factors in RTAs are all the factors that relate to drivers and the other road users. These may also include the behaviour of the driver, such as driving when distracted by self-induced conditions like taking drugs and or alcohol, speeding, getting oneself distracted (with the use of cell phone, communicating with passengers, listening to loud music or fatigue and disobeying traffic rules).

Drunken driving, as shown by studies, is a foremost cause of road traffic accidents (Gopalakrishan, 2012). According to global records, drunken driving accounts for the death of 480,000 deaths and injury to 20 million persons yearly. In most of the high-income countries, about 20% of deadly injured drivers have blood alcohol concentration (BAC) that is in surplus of the legal limit in their blood. On the contrary, studies in low-and-middle-income countries like Nigeria revealed that between 33% and 69% of deadly injured drivers and between 8% and 29% of non-deadly injured drivers had taken alcohol before they had accident (Global Road Safety Partnership, 2007). In Nigeria, drunken driving is customary among commercial vehicle drivers (Aworemi, Abdul-Azeez and Olabode, 2010). Alcohol, like cannabis, reduces concentration level when driving (Harrison and Fillmore, 2011). However, the use of both substances is more severe (Hartman and Huestis, 2013).

Another driver factor that contributes to RTA is over speeding. It increases the chances of sustaining injury exponentially (FRSC, 2011). However, a commercial vehicle driver's choice of speed largely depends on the expected cost of speeding and the expected benefits associated with speeding. Further to the monetary benefits accruing from the time saved, one of the major intrinsic benefits of speeding is the thrill and adventure associated with the driving experience (Tay, Champress and Watson, 2002).

Recently, distraction during driving has come to be identified as another factor that contributes to RTA. To Regan, Hallert and Godorn (2011), distracted driving has to do with "insufficient, or no attention to activities critical for safe driving". This implies that the driver fails to give sufficient concentration to the driving job ahead of him. Commercial vehicle driver distractions can include eating, drinking, manipulating dashboard controls, listening to music and talking on a phone or to a passenger. The

potential for a particular form of distraction to increase crash risk depends on a number of factors. This includes the immediate degradation of driving competence which posed a distracted driving behaviour, the frequency through which the distraction occurs, and duration of the distracted driving behaviour (Foss and Goodwin, 2014).

Others include driver's fatigue which is common among commercial vehicle drivers who travel a long distance. Foss and Goodwin, 2004). Most faulty decisions that result in RTA are attributable to ignorance on traffic regulations and procedures. Studies on Nigerian commercial vehicle drivers' behaviour at traffic signals and pedestrian crossing indicated that the drivers tend to be less disciplined than in any other countries (Odero et al, 1997). Aworemi et al. (2010) also attest to the fact that many (commercial vehicle) drivers display irrational behaviour while driving.

However, some factors have been identified to influence safe driving behaviours, particularly, among inter-state commercial minibus drivers. The most prominent factors are driver's psychological characteristics such as knowledge and attitude. More specifically, the commercial driver's decision of violating the regulation comes from his knowledge and attitude towards the rules and acceptance of the rules. Driver's knowledge and attitude are influenced by a range of factors, which include experience and educational attainment.

There is evidence that driver's driving experience influences road crash risks. Young inexperienced drivers are more likely to be involved in road crash than drivers who are older and more experienced (Groeger, 2006). Inexperienced drivers lack the skills to effectively and efficiently recognize and respond to hazards, that is, they have not acquired the detailed experience in proper hazard scanning and may focus on non-crucial elements in the driving scene (Dickinson, Chekaluk and Irwin, 2013). More specifically, the failure to attend to and recognize hazards results from lack of recognitive and motor schemas that are gained from experience in driving and that enable the driver to recognize and respond appropriately to hazard (Dickinson et al; 2013)

Education is another important factor influencing safety driving. Shinar, Schechtman, and Compton (2001) found that the number of people who reported that they observe the speed limit decrease with increase education. This finding was supported by Dobson, Brown, Ball, Power and McFadden (1999) who reported that drivers with higher education reported that they speed more than those with lower level of education. They further observed that women with higher scores for violations, speeding, lapses and errors were women with tertiary education.

In Nigeria, poor knowledge and attitude to safe driving behaviour are the major contributing factors for many crashes particularly among commercial minibus drivers (Olufunmilayo, Odeyemi, Ogunnowo, Onajole and Oyediran, 2011). Following these observations, several researchers in the country have suggested road safety education for improvement (Okafor et al; 2014; Johnson and Adebayo, 2011). Generally, some developed countries create awareness by organising special programmes to improve the commercial minibus drivers. For example, in Australia, Minibus Drivers Awareness Scheme (MiDAS) is organised by the Community Transport Association to promote driving effectiveness. A similar programme called minibus driver awareness scheme also operates in the United Kingdom.

Multimedia-based road safety education (MbRSE) is a more active strategy that could be applied to assist drivers in Nigeria. In this study, MbRSE consists of several materials such as video slides, films show, documentary, posters, handbills and general discussions (lectures) on road traffic rules and regulations, dangerous driving, over speeding, light traffic signs, neglect of seatbelt, mobile phone use on motion, drunken driving, route violation, driving under unusual or emergency situation and handling emergency situations. Multimedia-based road safety education is not going to stop road transport accidents (RTAs) among commercial minibus drivers but form an important part of health advertising structure for preventing injuries and could be used at the interpersonal level. Multimedia-based road safety education is a feasible intervention for improving knownedge and attitude of commercial minibus drivers towards safe driving behaviour. However, clear evidence of its efficacy has not been fully established in Nigeria. This study therefore aimed at examining the effects of multimedia-based road safety education on knowledge and attitude to safe driving behaviour among inter-state commercial minibus drivers in Ibadan, Nigeria.

1.2 Statement of the problem

Road Traffic Accident (RTA) is a foremost source of death and disability among inter-state commercial minibus drivers in Nigeria. This may be associated with the drivers' poor knowledge of and attitude to safe driving behaviour. These drivers engage in risky driving behaviour (RDBs) characterized by driving under the influence of drugs and alcohol, travelling too fast, distracted driving (by using cell phone, communicating with passengers, or listening to loud music), fatigue and ignoring the traffic rules and regulations. Those involved in traffic accident suffer death and severe disability, thereby

exposing their families to enormous economic and social hardship. Previous studies have focused more on publicity campaigns for the causes, consequences and avoidance of RTAs, particularly those relating to the Federal Road Safety Corps with little emphasis on safety education interventions. This study therefore, deterining at examining the effects of multimedia-based road safety education on knowledge and attitude to safe driving behaviour among interstate commercial minibus drivers in Ibadan metropolis, Nigeria. The moderating effects of educational attainment and driving experience were also examined.

1.3 Objectives of the study

The general objective of the study was to examine the effects of multimedia-based road safety education on knowledge and attitude to safe driving behaviour among interstate commercial mini-bus drivers in Ibadan metropolis, Nigeria. The specific objectives are to:

i. determine the significant main effect of treatment on participants'
   (a) knowledge of, and
   (b) attitude to safe driving behaviour;
ii. examine the significant main effect on educational attainment and driving experience on participants'
   (a) knowledge of, and
   (b) attitude to safe driving behaviour;
iii. determine the significant interaction effect of treatment on educational attainment and driving experience on participants'
   (a) knowledge of, and
   (b) attitude to safe driving behaviour;
iv. examine the significant interaction effect of educational attainment and driving experience on participants'
   (a) knowledge of, and
   (b) attitude to safe driving behaviour; and
v. determine the significant interaction effect of treatment, educational attainment and driving experience on participants'
   (a) knowledge of, and
   (b) attitude to safe driving behaviour.

1.4 Hypotheses

The following hypotheses were tested at 0.05 level of significance in the study.

Ho_1: There is no significant main effect of treatment on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_2: There is no significant main effect of educational attainment on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_3: There is no significant main effect of driving experience on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_4: There is no significant interaction effect of treatment and educational attainment on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_5: There is no significant interaction effect of treatment and driving experience on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_6: There is no significant interaction effect of educational attainment and driving experience on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

Ho_7: There is no significant interaction effect of treatment, education and experience on participants'

(a) knowledge of, and

(b) attitude to safe driving behaviour.

1.5 Significance of the study

Despite the increasing pace of traffic accidents on Nigerian roads and its consequence on the rate of death in Nigeria, no substantial study has addressed the impact of multimedia-based road safety education on driving behaviour of inter-state commercial minibus drivers. This study would therefore serve as a foundation for further research into the area of locally applicable interventions for improving inter-state commercial

minibus drivers' knowledge of and attitude to safe driving behaviour, thereby reducing the incidence of RTAs.

The study is significant in that it would reveal the efficacy of the multimedia-based RSE in helping inter-state commercial minibus drivers learn more meaningfully and acquire necessary skills required to embark on safe driving behaviour. It would also help to broaden the knowledge of road transport unions such as National Union of Road Transport Workers (NURTW), Road Transport Employers Association (RTEAN), and other public and private organizations involved in road transport development services.

This study would provide relevant information for Federal Road Safety Commission (FRSC), Federal and State Vehicle Inspection Officers (VIOs) on how best the inter-state commercial minibus drivers' knowledge and attitude to safe driving behaviour can be better enhanced. It would also provide information for local legislation and policy makers thereby influencing their decisions to ensure safe driving standards in Oyo State and Nigeria as a whole. More importantly, this study would contribute to knowledge account improving the knowledge of and attitude of inter-state commercial minibus drivers to safe driving behaviour thereby reducing the prevalence of road traffic injuries.

1.6 Scope of the study

The focus of the study was to examine the effects of road safety education (traditional and video-based programme) on knowledge and attitude to safe driving behaviour among inter-state commercial minibus drivers in Ibadan, Nigeria. This involved selection of registered (with NURTW) inter-state commercial mini-bus drivers from two motor parks namely, Iwo Road/Lagos and Ojoo motor parks in Ibadan, Nigeria. The inter-state commercial minibus drivers were chosen because it is believed that this group of drivers are highly associated with unsafe driving behaviour such as over-speeding, driving under the control of drugs and alcohol, distracted driving and disobeying the traffic rules and regulations.

The study was restricted to the road safety education because of the assumption that it is grounded on the principle of behaviour change. This aimed at helping the drivers improve on their knowledge of and attitude to safe driving behaviour and thereby reducing the incidence of RTAs. However, the study is restricted to the two motor parks because they have the highest number of commercial mini-buses in Ibadan metropolis, plying various parts of the country. Nonetheless, they are assumed to be convenient and

adequate to provide opportunity for comparison of the objectives and for the generalisation of the research finding

1.7 Operational Definition of Terms

The following terms are defined as they are used in this study:

Multimedia-based Road Safety Education: This refers to the instructional package extracted from 2008 Highway codes for inter-state commercial mini-bus drivers in Ibadan metropolis. It focuses on conceptualizing road traffic accidents, motion management techniques, principle of defensive driving, techniques for driving under special conditions techniques for driving on the expressway and first aid treatment. These were complemented with video slides, films, posters and handbills.

Knowledge of Safe Driving Behaviour: This refers to the ideas and facts that he participants have about safe driving. It is measured though their (participants) knowledge about take-off, reversing, speeding, seatbelt use, defensive and expressway driving, driving under the control of drugs, road traffic signals, signs and markings, driving under special conditions, and emergency and rescue

Attitude to Safe Driving Behaviour: This refers to the expression of the participants' intend actions to Safe Driving behaviour. It is measured through their (participants) attitude towards drunken and distracted driving over speeding and traffic regulations.

Inter-state commercial drivers: This refers to the participants who engage in driving for monetary gains. They are characterised by plying on highways and exhibiting risky driving behaviours such as over-speeding and driving under the control of drugs and alcohol.

Educational Attainment: This refers to the participants' level of education. This is measured through their responses to the categories of education, ranging from "None to tertiary education".

Driving Experience: This refers to the participants expertise in the area of driving on the expressway. It is measured through their ability to handle hazards created by animals, pedestrians and other drivers.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter focuses on the review of related studies and theoretical framework for the study. The purpose is to give rational explanations for explaining the efforts of multimedia-based RSE on knowledge and attitudes to safe driving behaviour among interstate commercial mini-bus drivers in Ibadan metropolis, Nigeria.

2.1.1 Historical Development and Importance of Road Transport in Nigeria

A historical perspective of road development is necessary for a better perception of the problems affecting the functionality of roads in the Nigerian transport network. Before the colonial period, Nigerian communities were linked by local roads (connecting towns with their outlying villages, farms with villages and villages with one another) and highways (connecting towns and kingdoms). These roads which were used mainly by animals and pedestrian traffic were narrow, winding and impassable during the raining season. Modern roads were constructed in the 20th Century to feed the railways and, thus, provide a means of moving natural resources in the hinterland to the ports for shipment abroad.

The Nigerian Railway Authority contributed immensely to early road development. Road building often duplicated the spatial pattern established by the railways and connected interior areas to the major ports. In 1925, the colonial administration established the Road Board which initiated the integrated road development in Nigeria. By 1951, out of the total of 44,414km of roads built in Nigeria, 1,782km were tarred. However, some of the roads were in single lane. Some of them were constructed in locations with sharp bends and others in locations with inappropriate poor drainage arrangement. Thus, the standard of road being constructed was enhanced since the span of the network increased. Consequently, by 1952, 15,785km of bituminous surface and 75,200km of earth/gravel surface roads had already been constructed in Nigeria (CBN, 2003).

During the First National Development Plan periods (1962-68), there was emphasis on the construction of Federal roads (mainly in urban areas) through widening, straightening and improved road surfacing. On the other hand, roads in rural areas were completely neglected, inadequately catered for or left in the hands of the local people (farmers) themselves. This situation affected rural-urban movement of goods (mainly agricultural products) and passengers. The realization of the inadequacy of the transport

network to bridge the socio-economic gap between the urban and rural areas informed the Federal Government decision to pay more attention to rural roads. The attention was included in a Ten-Year National Road Development Scheme. The scheme was intended to establish and improve an integrated network of primary, secondary and feeder roads in Nigeria. This led the government to make a substantial investment on the construction of roads during the 1970-1974 Development Plan periods. The trunk roads were classified as either "A" or "B". Hence, the maintenance of the “A" and “B” (intra-state roads) roads were the duty of both the Federal and state governments. Meanwhile the local governments are to handle the construction and maintenance of intra-urban and rural feeder roads.

The Federal Government increased its share of the national road network, by taking over 16,000km of the trunk "B" roads from the State governments in 1974. This increased the Federal road network from 11,000km to 27,000km while the State and Local government share of the road network were 7,213km and 62,719km respectively. Similarly, the State governments were in turn expected to take over the feeder roads from the local governments so as to improve the rural roads and provide infrastructural support to the government's agricultural development policy.

The total length of roads has increased in quantity and quality since 1960. The total length of roads in the country increased from 71,870km in 1962 through 95,374km in 1972 and 114, 768km in 1980. Roads with bituminous surface increased from 11, 053km in 1962 to 28,632km in 1980. As recorded by the Central Bank of Nigeria (CBN, 2003), Nigeria has a total of 193, 201km of road network which is undertaken by the three tiers of government. The Local governments who control the intra-urban and rural roads do not have the necessary financial and technical capability to develop these roads. Hence, most rural roads are earth-surfaced, winding, narrow, and impassable during the wet season.

This condition has serious implications for the development and economic growth of rural areas where over 70% of the population resides. In 1986, the Federal Government established the Directorate of Foods, Roads and Rural Infrastructure (DFRRI) with the aim of developing rural feeder roads nationwide to ease the movement of farm produce to the marketplace. Although 110,470.74 km of roads was expected to be constructed by the agency, only 60,829.32km (55.1%) were constructed as at 1992. Due to the inability of DFRRI to successfully open up thousands of rural settlements in the country, construction

of roads was taken over by relevant departments under the Federal Ministry of Water Resources and Rural development and State Ministries.

Road transport plays a very significant function in a country's social and economic life. Due to its flexibility, it provides easy access between spatially distributed activities. Roads integrate urban and rural settlements and facilitate local, regional and inter-regional movement of goods and people. Roads are in the center of interconnectivity of all modes of transport. Road transport has an extensive route network and is particularly suitable for short and medium distance travel. The importance of road transport in traffic movements in Nigeria cannot be over emphasised. Although there are no recent data to demonstrate the increasing importance of road transport in passenger movement, available evidence on vehicle statistics shows that vehicle registration has been increasing since the Stanford study of 1960. Newly registered vehicles during the period in Nigeria show that registration of passenger vehicles increased from 177,480 in 1981 to 957,447 in 1997, representing 439% increase.

The highest numbers of vehicles were registered in 1997. After this period, vehicle registration declined to 144,226 in 2000. Motorcycle registration increased from 6,330 in 1981 to 65,253 (930% increase) in 2000. Road transport's importance in freight transportation has also increased overtime. The above increase is clearly linked to the poor performance of the rail system and the huge government investment on roads which reduced road use charges. It is essential to note that these new vehicle registrations which occurred annually are incremental. This means that the figures are cumulative, that is, the new vehicle registration in 1983 is added to what obtained in the two previous years. Available data on vehicle fleet in Nigeria further supports the fact that the new registrations are incremental. Motor vehicle fleet was said to have increased from 195,000 in 1975 to 615,556 in 1985, but declined to 218,726 in 1995 (FRSC 2008).

In spite of the yearly net gain in vehicle population in Nigeria, there has been no commensurate increment in road network expansions or constructions for over a decade. Coupled with this, the existing road stock has been greatly depleted in terms of quality. While it has been noted that there was a substantial investment in road network constructions in the 1970s (Bio, 2009), the length of road network has stayed at 193.200km since 1997 (World Bank, 2004). Unfortunately, much of this inadequate road network is in a parlous state. Only 16.4 per cent (31,730km) of the total road network were in good condition in the year 2000. In 2005, 80 per cent of federal and state roads

were in deplorable states and in 2007, only 15 per cent of federal roads were said to have some evidence of structural integrity (Adesanya, 2008; Akinyemi, 2012).

2.1.2 Problems and Issues in the Nigerian Road Sector

A number of problems and issues with far-reaching significance for the future improvement of the road transportation scheme in Nigeria arose from the discussion above. This section addresses some of these issues namely; road pavement failure, poor road maintenance, inadequate funds and excessive use of roads.

Road pavement failure

Road failure occurs when there are defects on the road surface and the pavement structure. A pavement is the durable surface material (usually asphalt or concrete) laid down on a locale to ease the passage of vehicles and pedestrians. Such pavements include a road or pathways. Pavement malfunctions can be surface pavement or deep-seated pavement malfunction. According to Mahmoud, Zaynab and Hadi (2012), flexible pavement structure consists of layers of materials.

Materials used and the thickness of same determines the pavement performance. According to Akintomiwa, Ojo and Oluwafemi (2011), causes of road failure can be classified as geological (that is, it is based on the nature, nearness, presence, and existence of soils surface geologic sequence, laterites, ancient stream channels, respectively), geomorphologic (topography and surface/subsurface and drainage system), road usage, road design, construction and maintenance.

Road failure in Nigeria manifests as (a) Distress which is a product of the failure of the bitumen cover, (b) 'Wavy' surface which arises from provision of the pavement substance, resulting in recurrent bumps on the highway, (c), longitudinal cracks which run equivalent to central line of the thoroughfare, and (d) potholes that extend through the pavement, and occasionally to the sub-grade (Akintomiwa et al, 2011). Road failure in some areas has been attributed mainly to the geotechnical nature of the soil used as sub grade material during road construction. Gidigasu (1976) gives a list of structurally unstable, tropical and residual soils usually employed for road construction similar to Nigeria as follows: 1) igneous rocks; 2) carbonates rocks; 3) expansive-shrinkable soils; 4) humic red clays of high rainfall regions; 5) Soils that are highly susceptible to weathering and erosion; 6) Soils with high chloride content; and 7) Profiles of latertic materials, including concretes, silcretes, e.t.c.

Mahmoud et al. (2012) investigated highway pavement failure on locations along Gombi-Biu road in Adamawa State. The authors observed that poor soil properties, which make up the pavement, led to its failure. Akintomiwa et al. (2011) use of remote controlled and geotechnical data examined the reasons for regular pavement malfunction, using the Ilesa-Akure main road in Southwestern Nigeria as the case study. Results of the analysis indicated that the failure was caused by the kind of material used. Adewoye, Adegbola, Bolaji and Opebiyi (2004) reported that flexible highway failure on Oyo-Ogbomoso road, Southwestern Nigeria are due to poor drainage, inadequate maintenance, abuse of the freeway pavement, and leakage of overflow due to rain. Aigbedion (2007) in a study along Opoji, Uwenlenbo and Illeh in Ekpoma, observed that failure on the road was as a result of poor drainage and the construction of the road over clay. Aghamelu and Okogbue (2011) noted that the use of Abakaliki shale formation in all components of highway pavement in the Abakaliki area of southeastern Nigeria was responsible for road pavement failure due to its unfavorable moisture content and predominance of expansive clays.

Similar effects of sub-grade materials on roads were observed by Ola (1988) in Maiduguri, Sadiku (1985) in Cross River State, Omange, Nnama and Aitebaomo (1988) in Bayelsa and Rivers States, Ola (1980) in Sokoto, Farrington (1983) in Lagos State, Okafor and Okonkwo (2009) in Enugu, and Okunade (2007) in Abia and Imo States. Geotechnical analysis of soils used as sub-grade material is therefore necessary to achieve good pavement management during construction and maintenance phases. Also, high standard materials, adequate designs and quality control should be carried out during the building process.

Poor road maintenance

Road maintenance involves the repair of deficiencies that evolve on roads due to the age of the road, the rate of use and the effects that climatic elements have on the road and the prevention of other deficiencies. When the maintenance of road is neglected, not properly or routinely performed, it results in fast corrosion of the road and ultimate failure from the impact of both climatic condition and vehicular use (Akinyemi, 2012).

Three major forms of maintenance are usually carried out: routine maintenance which is done continually on every road such as line marking, clearing of drainage and bridges and maintenance of culvert; recurrent maintenance such as maintenance of pavements, repair of potholes and grading which is done at a definite length of time

within the year depending on the topography of the area and the climatic condition of the road. It also depends on the traffic volume on the road; in addition, carry out periodic maintenance that is rehabilitating the weakened parts of the highway at regular intervals by engaging in surface dressing, resealing the road and re-gravelling (Abdulkareem, 2003). Emergency repair is carried out when an incident that poses an immediate hazard to public safety occurs, for example bridge wash out due to storms or slippery road surface resulting from a spill.

According to Akinyemi (2012), a road survey undertaken in 2002 revealed that most of the roads are in very terrible condition due to long years of neglect. The study also indicated that to bring the Nigerian road network into a moderately good state, the sum of 300 billion naira will be required over a period of 10 years. After a successful recovery, there will be need for subsequent maintenance, and an average of 24 billion naira will be required each year and 32 billion naira will be required per year for road rehabilitation. If the roads are further neglected, the implication is a loss of network value, valued at 80 billion naira per year and in addition to vehicle operating cost which results from substandard roads valued at 53.8 billion naira per year.

The deplorable state of the roads are now worsened by increased torrential rainfall resulting in collapse of bridges, flooding of roads due to bad drainage, erosion of road base and road wash out. For instance, According to reports by The Nation newspaper of August 28th, 2011, the Friday, August 26^{lh}, 2011 flood in Ibadan, Oyo State, caused by heavy rainfall and bad drainage channels, led to the destruction of properties estimated at two billion naira, death of more than 100 people and displacement of thousands of residents. Several bridges were destroyed and some major roads were rendered impassable. Hundreds of vehicles were submerged and motorists were stranded along flooded roads. At Apete, the community was cut off from the city as the bridge linking it with the city caved in. The narrow bridge linking Odo-Ona Elewe community was also destroyed leaving the road impassable (Akinyemi and Onuka, 2012).

Similarly, the 2012 floods which affected 26 States in the country attracted both national and international attention because of their unprecedented height and extensiveness. Although data on the effect of the flood for the entire country is not available, reports from various States indicate that thousands of people were killed while millions of persons were displaced from their homes. Thousands of hectares of farmlands were washed away in nine states. The flood also destroyed many major roads and bridges.

Consequently, socio-economic in the activities in the states were paralysed as people could not access schools, markets and offices.

The East-West road linking Warri and Port Harcourt was flooded and impassable for several weeks. The badly affected portions were between Ughelli and Patani and between Mbiama and Ahoada. The Kiyawa-Birnikudu road in Jigawa State was cut into two creating considerable transportation bottlenecks. The most significant link affected was the Lokoja-Abuja road as travelers were stranded and perishable goods destroyed. Although the flooded roads may not have been designed for such stress, long periods of neglect, faulty construction and poor drainage made the roads vulnerable to flood damage (Akinyemi, 2012).

Inadequate funds

Road construction and maintenance incures huge investments. In Nigeria, allocation of resources for the improvement of transport infrastructure is a public sector decision. Transport investment however, is only one of many allocation decisions which has to be made by the government. Funds for road construction are provided by the tree tiers of government. Although government investment is substantial, the amount allocated to road construction however is insufficient for the provision of an efficient and safe road system. Established in 1999, the Presidential Policy Advisory Committee (PPAC) suggested the institution of Road endowment which was hoped to get its finances from tolls collected on the highway, taxes on vehicles, truck weigh-bridges, fees for parking at designed areas and petroleum tax. The funds are expected to be remmited to the country's joint account, while the budget for road maintenance is from the allocation of budget. But the fund released for road maintenance falls short of the revenue from the road fund. For instance, CBN (2003) notes that a total of 30.9 billion naira was requested by the FMWH for road rehabilitation between 1999 and 2002 but 2.8 billion naira (9.2%) was appropriated and only 1.5 billion naira (53.5% of amount appropriated) was released. The total amount released was far below the total sum of 2.09 billion paid into the federation account by the Federal Highways Toll Plaza Management Committee (Akinyemi, 2012).

Excessive use of roads

As indicated previously, road transport accounts for over 90% of local transport activities in the country. One clear effect of this is the concentration of articulated

vehicles used for the movement of heavy goods across the six geo-political zones on the highways. Although, the roads are subjected to wear under the action of traffic, increased traffic load in terms of number and axle loads beyond the capacity of the road overtime wears the macro surface texture and gradually reduce the high speed skidding resistance. Defects caused by heavy traffic include depression (pavement surface failure characterised by prominent channel-like features), fatigue cracking (alligator shaped cracks or fractures), and polishing (surface with rough exposed aggregates).

Overloading of roads is as a result of the poor performance of the railways which potentially provides efficient and cost effective services, principally on long distance routes in order to serve high density traffic flows. Railways should be used as an alternative. In addition, it is suited for the transportation of passengers and bulky goods over a long distance. Regrettably, the railways have been moribund due to low quality of its management and the inefficiency in its decision-making process, poor pricing and low public investment on rail infrastructures. Shortage of funds to the railways hampered the purchase of new rolling stock and the improvement of track conditions. Iwayemi (1987 as cited in Akinyemi, 2012) observed that an aggressive road investment programme, a lassiez-faire regulatory policy coupled with poor rail services attributed partly to government neglect and partly to organizational inefficiencies, have made rail to lose its potential comparative advantage over road particularly in freight traffic. The deterioration of the railways, increased overtime to the extent that it became barely operational.

Although government plans to transfer the administration and operations of the railway system to the private subdivision, the rehabilitation of the existing rail network has commenced. When the network is expanded, coupled with efficient service delivery, then, heavy goods carried by trucks will be transported by rail. It is imperative that a more active road regulatory policy be adopted in spite of vested political interests in road transport. Distance, weight and safety restrictions should be imposed on the road haulage industry to minimise the social cost they impose. These policy measures would help ensure a fairer competition between road and rail and better resource allocation in the transport sector (Akinyemi and Onuka, 2012)

2.1.3 Global Situation of Road Transport Accidents

Road accident affects the quality of life and has major consequences socially and economically which have been attributed to the combined errors from humans and road signs, unpleasant road conditions, vehicle defects, inability to apply protective gadget that

reduces the high rates of injuries sustained (Nantulya and Reich, 2002). This problem has initiated research in many countries into the incidence and causation of RTA, injury sustainability and how these may be treated or alleviated (Mason and McCarthy, 1990). According to Murray and *Lopez* (1996), in an estimate made for the WHO and World Bank, road traffic injuries (RTIs) caused 1,170,694 recorded deaths worldwide in 1998. Likewise, according to the WHO, road traffic crashes have caused nearly 25% of all fatalities due to traumatic injuries worldwide, with 90% of the deaths cases in low- and middle-income countries, such as Nigeria (Murray and Lopez, 1996).

Statistics from many developing countries confirmed that the causes of RTAs vary (Peden et. al. 2004). For example in Mexico, while mortality rates from infectious diseases declined from 43% to 17%, deaths from injuries rose from 4% to 11% of all deaths, with RTAs causing most of the deaths (Frenk, Bobadilla and Sepuwede, as cited in Onyema, 1989). In Tanzania, between 1990 and 2000, the number of RTAs rose by 44% and death by more than 64% during the same period (Museru, Meharo and Leshabari, 2003). In Ghana the number of reported accidents between 1994 to 1998 were 10,715, while 1,362 died, 11,405 were injured and the number of vehicle involved were 16,892 (Afukaan, Antwi and Ofosu-Amaah, 2003).

South Africa and Nigeria have the highest cases of deaths in Sub-Saharan Africa (Odero, 2004). While South Africa has had a consistent value of over 9,000 deaths over time, Nigeria's case has declined from 9200 recorded in the early 1990 to 6,185 deaths. According to Nzegwu and Nzegwu (2005), the poor road conditions, road-unworthy vehicles, uncaring and drunken drivers, and persons on foot are the causes of the burden of road traffic injuries. It is equally caused by urbanization, industrialization and rapid motorization, (Nantulya and Reigh, 2002). The burden and causes are largely neglected as a health issue, perhaps because they are still viewed by many as events that are beyond our control. It is underrated as injuries observation in many underdeveloped countries is not well recognised (Aliyu, 2002).

The present framework of the road system in Nigeria was formed in 19th century through the footpaths constructed by hunters and traders. The 20th century led to a rapid development of roads. Today in Nigeria, roads are in a very deplorable situation that automobiles find it difficult to move freely, and this calls for the need for such as safety belts for casualties' reduction. In recent times, many lives have witnessed at least a five-fold increase in recorded traffic-related losses. The proportion of death increased from 38.2% to 60.2% within ten years (Onyema, 2009). More specifically there was a total of

14,544 accident of which 22,112 were injured while 7,407 were killed in 2002. This was increase 14,087 in 2004 (FRSC; 2007).

2.1.4 Economic and Social Burden of Road Transport Accidents

Annually, over one million deaths are recorded worldwide, approximately 50 million people are injured every year from Asia and African countries (Maso, et al., 1990; World Health Organization; WHO, 2004). Millions of people struggle to cope with the death or sickness of the members of their family as a result of RTAs. This has led to the destruction of enormous human potential with grave social and economic consequences, especially in developing countries (Obuekwe, Ojo, Akpata and Etetafia, 2003). As a result of these consequences, many are placed in a grave burden of household finances, especially in situations where it results in the death of a family bread winner (Odero et. at, 2007). The entire burdens had led to the economic cost of accident cases, estimated at about 74 billion dollars annually by the National Highway Traffic Safety Administration (NHTSA), Gantz and Henkle, (2002).While it is estimated at 1% of Gross National Product (GNP) in low-income countries, it is estimated at 1.5% in middle-income countries (WHO, 2004). As recorded by Peden et al (2004), in the year 2002, in RTAs globally, there was a projected 1.2 million people deaths 50 million injuries, which cost the world about $518 billion.

According to Krug (1999 as cited in Onyema, 2009) RTAs are positioned 14th foremost cause of death and 15th cause of disability. It is also among the 15th foremost cause of death for those between the age of 0 and 4 years (that is at the rate of 13.7 deaths per 100,000), and for those aged between 45 and 59 years (that is at the rate of 22.8 deaths per 100,000) worldwide (Mohan, 2001). It affects the children as the figure of children killed in traffic crashes was projected at 240,000 and 10,000 per year in developing and developed countries respectively (UNICEF, 2001). For school-age children from 5-14 years, RTA is another main cause of death. In fact, it is next after malaria and acute lower respiratory tract. It is also the second highest causal factor of disabilities among young and middle age people (between 15 and 44 years), RTAs are ranked second globally; it is superceded only by HIV/AIDS. Since 1972, the overseas unit of the UK Transport and Road Research Laboratory **(**TRRL) has been engaged in a program of research on road accident in the developing countries.

Results indicate that fatal accident rates are high compared with developed countries (Ameratunga, and Norton, Hijarand 2006). However, in Africa, road safety

suffers from severe under-funding; it is disproportionately low in the impact it has on both mortality and morbidity (European Transport Safety Council). Many developing countries have experienced a worsening situation Nantulya and Reich, (2002); WHO, (2004). Comparatively, death rates per licensed vehicle in underdeveloped countries are higher than they are in developed countries, whereas the situation improves generally in Europe and North America (World Disaster Report, 2000). Furthermore, the developing countries experience a rapid rise in fatality rates per licensed, ranging from 340% in Africa, 200% in Asia and the Middle East, and about 30% for countries in Latin America over the same period (Ross et al, 1991). With nearly 3000 deaths on Kenyan roads annually, Kenya is rated as one of the countries with highest road death rates in line with vehicle ownership in the world, (Assum, 1998). Kenya approximately has 68 fatalities per 10,000 registered vehicles (Odero, et al. 2003 as cited in Onyema, 2009).

2.1.5 Drivers' Risky Driving Behaviour and Road Traffic Accidents

Alcohol consumption before or during driving is one of the foremost causes of RTAs. Incidentally, RTAs caused by alcohol consumption between 1982 and 2010 decreased from 60% to 38% (National Highway Traffic Administration, 2013). Other risky behaviour which has long been known to cause accidents while driving include eating, chating with passengers, and so forth (Treat, Tumbas and Mcdonald, 1977). There are other contexts in which distractions happen; for instance, a phone conversation while driving, or other occasions where sudden and unexpected situations which require highly focused attention appears (like a situation where an object suddenly drops on the road). Drivers often fail to notice such rare events; in situation where they notice, time might be insufficient for them to react.

Most defective decisions that end in motor vehicle crashes are attributable to ignorance of traffic regulations and procedures. All ill-informed road users portend a crash waiting to happen, often with fatal consequences (Gbadamosi, 1994). Existing studies such as Dixey (1999) and Gbadamosi (1994) on the behaviour of road users at traffic signs and pedestrian crossings have shown that the users in developing countries seemed not to be as disciplined as road users in developed countries. The studies revealed that drivers in the developing countries hardly stop for pedestrians at uncontrolled pedestrian crossing; and they rarely use such crossing compared with drivers in developed countries. Downing (1991) and Gbadamosi (1994) indicated relatively high proportion of drivers in developing countries, crossing continuous "no over-taking" lines

and not stopping at stop symbols even when traffic were near. However, the connection between the discrepancies in behaviour and RTAs has not been determined. The effect suggests that road safety actions such as road signs and markings which is not self-imposing may be much less effective unless they are integrated with advertising, enforcement campaigns and training programmes (Gbadamosi, 1994).

2.1.6 Establishment of Federal Road Safety Commission (FRSC) and Road Safety Behaviour

Traffic evolves as a result of the necessity to shift people and commodities from one location to the other. The need for safety on the roads is a critical reason for traffic management. Chidoka in FRSC (2008) in marking the World Health Day, explained the importance of crossroads with traffic lights which appear in green, amber, and red indications. According to Chidoka, traffic light works best if the traffic lane is separated with a light green in order to allow left turns with no conflicting traffic. Meanwhile, it is the responsibility of the Federal Road Safety Corp (FRSC), established in 1988 and inaugurated in 1995, to make policy and ensure safety on the Nigerian roads (FRSC, 2009). The vehicle inspection officers (VIOs) also perform similar roles; however, their work seemed ineffective on the roadworthiness of vehicles, perhaps, because they were overworked, or due to corruption (Eke, 2001).

Benson (2005) reports that nearly every transportation mode has organizations like the Federal Road Safety Commission (FRSC), Nigerian Police (NP) and Vehicle Inspection Agency (VIA) that regulate vehicles and their drivers through different procedures. Yet, the safety standards seem inadequate or pitiable in Nigeria, possibly due to unending economic problems, which have led to bad state of roads that make it difficult to repair certain motor vehicles because of scarcity of their spare parts. In particular, the city of Lagos has very terrible traffic congestion.

However, the FRSC that was set up in 1988 by the then military regime of Gen. Badamosi Babangida is to regulate the traffic on Nigerian roads. They had the mandate of ensuring safety on Nigerian roads as well as to ensure issuance of valid drivers' licenses. The FRSC was also expected to inspect and ensure that the roadway systems are good for motorists. Hence, the FRSC functions can be broadly classified into three: First, they have a duty to drivers and vehicles; second, they are in charge of traffic rules; and third, they make regulation that affect different road sections across the country.

The FRSC also monitors the use of traffic control devices and materials to control traffic and create awareness to drivers and other users. These include road traffic sign, road symbols and road makings. They are described as life saving equipments (Sanni, 2005; Sleg, 2006), and as the life wire of all the road users (Oladimeji and Chika, 2011). Road traffic signs are road infrastructure erected by roadside to make available adequate information to all the road users.

All power-operated devices (except signs) for regulating, directing, or warning motorists or other road users, including the pedestrians are classified as traffic signals. In general, a traffic signal is installed at an intersection particularly to improve overall safety and reduce average travel time through an intersection and thus increase capacity. Further, there are two types of signals: hand signal and light signal. While the hand signal is useful for the traffic officer to control traffic and also for other road users to signal to others about what they intend to do, on the other hand, the light signal is shown by traffic light. (Figure 2.1). Special touches (used mostly at night) and direction indicator (trafficator) fixed to the vehicle are also used. The overall idea of signal either hand or light is to direct or communicate to motorists. Traffic signals (hand and light) are also used for traffic control. While the traffic hand is used by the traffic officer to signal motorists, the traffic lights signal, using three dissimilar colours – red, amber and green. While RED means STOP, AMBER means READY (to go or stop), and GREEN means GO.

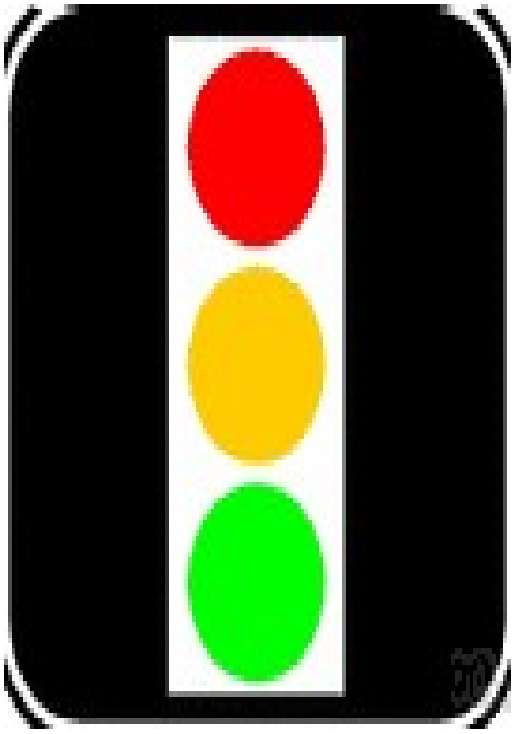

Figure 2:1: TRAFFIC LIGHT SIGNALS

SOURCE: FRSC, 2008. Nigeria Highway Code. Abuja; FRSC

green light - a signal to proceed
red light - the signal to stop
yellow light - the signal to proceed with caution

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- **Traffic Warning signs:**

Traffic warning signs are deployed to warn road users of a potential danger, obstacle or condition ahead which requires a special attention on the road.

Figure 2:2 TRAFFIC WARNING SIGNS

Source: FRSC 2008. Nigeria Highway Code. Abuja; FRSC

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- **Regulatory signs (Prohibitory)**

Regulatory signs are signs (Figure 2.3 and figure 2.4) that are used to ban certain maneuvers or some type of traffic. Such signs focus on speed limit, overtaking, parking, right and left or U-turn and wrong way.

Figure 2:3 REGULATORY/PROHIBITORY SIGNS

SOURCE: FRSC 2008. Nigeria Highway Code.
Abuja; FRSC

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- **Mandatory sign**

Mandatory signs are road signs which tell road users what must be done, while it is often silent on what must not be done. (Figure 2.4)

Figure 2.4 REGULATORY/MANDATORY SIGNS

SOURCE: FRSC 2008. Nigeria Highway Code.
Abuja; FRSC

25

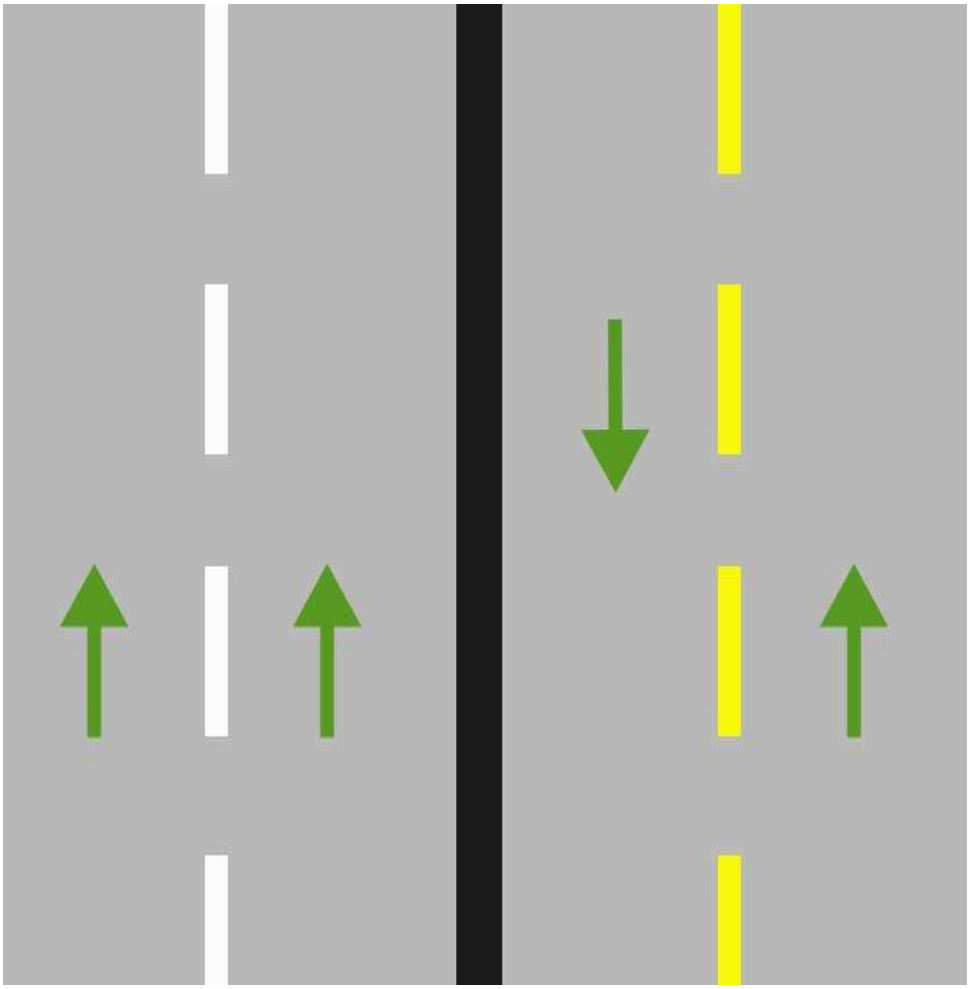

Figure 2.5 ROAD PAVEMENT MARKINGS

SOURCE: FRSC 2008. Nigeria Highway Code. Abuja; FRSC

Several years after, the operation of the FRSC has proved to be effective going by some landmark regulations to reduce carriages on Nigeria roads. One of such decisions on regulation of road safety policies was the mandatory application of safety belts by drivers and the passenger on the front seat; but the enforcement has been a problem (Onyema, 2009).

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2.1.7 FRSC Safety Education and Commercial Drivers' Risky Driving Behaviour

The role of alcohol to an increased danger of RTAs has been well recognized for many years. For instance, Fildes, Rumbold and Leeing (1991) observed that experimental study and epidemiological surveys, carried out in industrialised countries have discovered that the presence of blood alcohol concentration (BAC) in drivers has increased the hazard of their involvement in RTAs. However, the negative impact of drunk driving to blackouts, euphoria, poor co-ordination, balance impairment, poor judgement, impaired memory and slow reaction among commercial drivers was summarised by Osita (2010) as the causes of RTAs.

In accordance with the Road Safety Act (2007), the FRSC embarked on "Don't Drink and Drive" campaign in an attempt to further build-up towards ensuring a zero tolerance level in RTAs across the country, especially in the last quarter of the year. The campaign is carried out to ascertain strict compliance with traffic rules and regulations among road users in the country as part of measures to stem the tide of RCs that usually occur between the September and December. More importantly, this campaign takes place in major motor parks across the country. "Don't Drink and Drive" campaign is part of an advocacy in collaboration with the Guinness Nigeria Plc and the Nigeria Breweries Plc. The primary aim of this campaign is to discourage the habit of drink-driving among commercial drivers so as to reduce the incidence of alcohol-induced RCs in urban cities in Nigeria.

Moreover, the FRSC Annual Reports (2008) revealed that the campaign strives to promote responsive drinking among commercial drivers and other categories of road users and create awareness about the drastic effects of alcohol on the traffic conduct of every driver when taking the recommended limits. In such forum, total abstinence from all form of intoxicants and stimulants which negate the safe use of the highways are advocated. However, the lecture on the danger of drink-drive is followed by free distribution of handbills to commercial drivers that took part in the lecture series. In most cases, this is normally drink-driving. For follow-up, the FRSC officials on duty mostly carry out 'stop and test" exercise on commercial drivers with the aim of determining the BACs level (Osita, 2010).

Over the years, many industrialised countries have successfully reduced the number of crashes caused by drunk drivers. Drunk drivers often lack concentration while driving, while others engage in overspeeding. The FRSC as the lead agency put in place minimum and maximum speed limit (Table 2 and 2). Actual speed limit may range

beyond these values. Speeds are listed in kilometer per hour. The enforcement tolerance is specified in km/hr above the stated limit. However, this is another safety measure adopted by the FRSC as a measure to prevent RTAs and injuries on the highways; the law imposes maximum speed of 100km/h for any vehicle in Nigeria. Meanwhile, 'common sense' often dictates lower speed limits. For example, on a wet or slippery roads or when the view is not clear from smoky exhausts of other vehicles, harmattan dust or in foggy weather. In such a situation, common sense is needed to be applied. That is, two second rule.

Virtually in all the motor parks, commercial drivers are not only exposed to lectures on speed limit, drink-drive and stopping distance, but also made to watch a corresponding documentary on safety measures. Studies (Coley, Partrigdge, kaylor and Shapiro, 2002; FRSC, 2008, 2009; Kim and Yamashita, 2007) have shown that seatbelt is the most efficient feature to reduce the impact of injury that results from RTCs (Passmre and Ozanne-Smith, (2006). The legislation for obligatory wearing of seatbelt was first introduced in the State of Victoria, Australia in 1971 (Rutledge, 1993). Today, the entire world has laws enforcing the wearing of seatbelt (Ackaah and Adonteng, 2011).

Specifically, various campaigns on seatbelts are basically meant to increase public awareness on the fact that seatbelts can assist in avoiding severe injuries and or deaths during RTAs. Mabogunje (2002) explains that seatbelts are a secondary safety device that averts sudden or unexpected ejection from a vehicle when there is a sudden impact; it reduces the effect of such impact and serves as a cushion that distributes strength to the occupants during such an impact. Eghaghe (2010) points out that safety belt as well as crash helmets are proven to protect lives and lessen the severity of injury.

Nasar, Hechtlt and Werner (2008) have established that distraction is a danger factor for RTAs. Thus, FRSC included campaign against the use of some devices while driving. Such devices include cell phones, all cell phone connections to car stereo speakers or even the attachment of the television screen to the dashboard by commercial drivers. The use of phone while driving prevents correct response to road signs, symbols and markings, detecting hazards while eyes are off the road. At motor parks, on radio and television stations and through distribution of handbills, the FRSC personnel educate commercial drivers while driving. Also, Section 4 subsection 2(ff) of the FRSC Establishment Act of 2007 forbids a driver from making or receiving phone calls while driving. The enforcement through the arrest and imposition of times on erring commercial drivers forms part and parcel of the FRSC activities on the highways.

2.1.8 FRSC and Traffic Accident Prevention Strategies

In recent times, the FRSC personnel deliver lectures on various road safety tips. Specifically, the FRSC officials, in line with FRSC Act (2007), carry out campaign activities at Motor Park in an attempt to discourage any form of overloading. The public education department of the FRSC in collaboration with the executives and selected members of the NURTW, RTEAN and ACBOAN finalise arrangements for lectures and demonstrations on the impacts of overloading. The lecture is preceded with road safety films, showing danger inherent in the subject matter to the participants. Road safety handbills are later distributed to drivers, cyclists and other road users. This effort at the motor parks is also followed by the placement of advertorials on the pages of newspapers on the need to desist from any form of overloading and the danger inherent in it. However, fines are imposed on errant drivers and other road users who violate the stipulated number of passengers they are expected to carry at a time. However, overloading of vehicles by commercial drivers is a major source of RTAs in the Southwestern Nigeria (FRSC, 2007).

Rain affects the roads, vehicle and vision. Driving under an unusual or emergency situation like night time driving, driving under the sun glare, driving in the fog or smoke requires extra care, concentration, discipline and consideration (Elvik, 2009). Having realised the adverse effects of climate on RTAs, the FRSC carries out discussions on methods the commercial drivers can successfully use to drive vehicles during special conditions. Lectures and demonstration are given on the disadvantages of driving at night, in the rain, murky weather, and so forth. During motor park rallies, commercial drivers are drilled on how to drive safely and put through other things defensive drivers must note before they embark on a journey.

Some of the safety tips to adhere to while driving in the rain include turning on the headlights to improve vision, maintaining a good gap between you and the vehicle in front, reducing speed hereby sighting the brake lights of vehicles ahead. The FRSC facilitators encourage commercial drivers to avoid driving at night, check the threading of their tyres because properly maintained tyres provide the added grip needed on the wet roads, replace old and brittle wiper blades and pull off the road when other vehicles cannot be seen at a safe distance, especially when there is a thunder-storm, heavy rainfall or foggy weather. However, the aspect of the FRSC public enlightenment programme centres on light condition, road condition, a vehicle's condition and weather condition. Ibrahim (2012) presented that this aspect of the campaign or lecture on the subject

emphasises on never to claim the right of way because it may claim lives. The lecture series on this subject is rounded off with film shows and drama sketches on various subjects taught during the lecture series. Ross, Baguley, Hills and Silcock (2006) maintained that one of the contributory factors to RTAs in developing countries like Nigeria is lack of defensive driving techniques.

Public enlightenment campaign of the FRSC at motor parks also covers the responsibility of co-road users in the event of RTCs, first aid and causality handling. For the FRSC campaign, all road users must have the essential understanding of the first aid. The FRSC personnel normally complement this with a demonstration on how to apply each of the first aid items to different categories of injuries, especially broken bones and other injuries sustained by the victims as a result of burns, scalds, fractures and dislocation, coupled with the precautions to be taken by a first aid responder. Moreover, the FRSC personnel give lectures on first aid, so that the commercial drivers can give simple first aid treatment to an injured individual before the arrival of the FRSC rescue team or transfer of the RTA victims to the nearest FRSC mobile clinic or government hospitals.

However, it is mandatory for all commercial drivers to have first aid kit in their vehicles, which must contain absorbent cotton, adhesive tape, sterile gauze of various size, roller bandage, triangle bandages, aromatic spirit and iodine, tourniquet, elastic bandage, blankets, splints, safety pins, hand brushes, hot water bottle, small bath towel, ice bag, pillow and so forth. The activities of the FRSC at the motor parks also centre on safety lectures on basic vehicle checks that the commercial drivers must take into consideration on a daily basis. Other areas covered by the FRSC road safety lectures include basic checks on vehicle radiator water, engine oil, battery, tyres, clutch and brake (Asenime, Ege and Oni, 2006).

Aside from the FRSC education on how drivers should carry out a daily vehicle and safety parade on vehicle (checking of water, oil, fan belt and vehicle tyres), the brake, lights, wipers, horn and battery inspection are very importrant (Agwu, 2010). Commercial drivers are also taught how to extinguish different classes of fire. Oxygen, heat and fuel form the FIRE TRIANGLE. The demonstration shows the required fire extinguisher for different form of fire. Class A fire involves freely burning materials such as wood, paper and textile. To quench this class of fire, water in the form of jet or spray is required. Class B types of fire involves flammable substances like petrol, paint and grease. To quench this class of fire requires the use of liquid foam extinguisher, dry-chemical powder

(DCP), carbon-dioxide or dry sand. Class C types of fire involves liquefied petroleum like propane, butane etc. They are quenched with DPC and carbon dioxide fire extinguisher. Class D types of fire (involving metals; magnesium, zinc) require DCP fire extinguishers.

Dry powder and liquid gas are the two types of fire extinguishers. The prescribed units and sizes are as follows.

Table 2. Approved Fire Extinguisher for Vehicles

Vehicles	Unit Required (Unit)	Size (Kg)
Articulated	2	9
Lorries	2	6
Luxury Buses	2	6
Medium Buses	1	2
Light Goods Van	1	1
Taxis	1	1
Cars	1	1

Source: FRSC Archives, 2011

The FRSC activities at the motor park also cover commercial driver's education on the importance of plying on good tyres, the use of valid tyres, and dislike use of used or expired tyres, how to decode the four digits on the tyre and the capacity in terms of weight and air. The first two digits refer to the month, while the last two digits means the year of production. On different occasions at the motor parks, the FRSC facilitators educate commercial drivers on the need to prepare for unforeseen circumstances. Overall, the public enlightenment programmes of the FRSC with the support of commercial drivers and other road users are to reduce crashes by thirty per cent and fatality by twenty per cent in the urban cities in the Southwestern part (Agwu, 2010). According to Agwu (2012), the public enlightenment programme on good safety measure is one of the strategies to achieve the United Nation decade of action on road safety. He presented that using and perfecting this strategy of advocacy without enforcement would help change the poor attitude of commercial drivers and other road users, as it has been identified as the main source of RTA in the country.

2.2 Empirical studies

2.2.1 Road Safety Education and Safety Behaviour

More specifically, there are previous studies which confirm that road safety education enhance safety behaviour of drivers. Elliott and Armitage (2009) tested drivers' behaviour by selecting randomly three hundred participants to examine their effectiveness with speed limits. Other related studies in this regard include Parker, Manstead, Stradling, Reason and Baxter (1992), and Elliott, Armitage and Baughan (2003). However, Elliot et al (2003) found that theory of planned behaviour variables accounted for 32% of the unique variance in drivers' (N = 598) speeding behaviour, measured 3 months later, and that intention and perceived behaviour control were each significant independent predictors.

2.2.2 Knowledge, Attitude and Risky Driving Behaviour

Extant studies have also considered relationships between attitudes, crash involvement, and rule violations during driving, which varies according to the diverse ways in which attitude is measured. Such studies include Macmillan (1975) who investigated competitive and aggressive driver attitudes, and discovers that males, across all age groups, had appreciably higher convictions for motoring offences and higher numbers of accidents. Likewise, Rothengatter (2000), corroborated by Parker *et al* (1992), examined attitudes towards high and low-risk violations and observed that those drivers who regularly commit traffic violations have a positive attitude towards committing these violations.

Other studies related to attitude and risky driving behaviour include Elander, West and French (1993), Quimby, Maycock, Palmer and Buttress (1999), Hakkanen and Sunmala (2000), Verwey and Zaidel (2000).

2.2.3 Education and Safety Driving Behaviour

Dixey (1999) and Okafor et al. (2009) described highway safety education as consciously training all road users in proper and lawful behaviour on public roads and highways. The basis of road safety education involves improving the knowledge of road traffic lands and highway code, road signs comprehension and signals of traffic. Other cardinal principles centres on knowledge of one's responsibility while driving, according respect to other highway users and traffic control officers and their directions, to encourage concern for the safety of all road users and effectiveness in driving.It is traffic

education deficiencies that are responsible for road transport problems (e.g. traffic injuries) in Nigeria. However, improper co-ordination among the three traffic elements, namely, the driver, the highway and the motor vehicle more often than not lead to road accidents in Nigeria (Oladimeji and Chika, 2011).

Globally, road safety education is meant for behavioural change. It is part of the measures meant to enforce the three golden rules which form the basis of any road safety policy on the behaviour of road-users, including avoiding over speeding, avoiding drinking while driving and using the safety belt, and the need for them to be obeyed.The negative impacts of drunken driving have been summarised by Osita (2010) to include poor coordination balance impairment, poor judgement impaired memory and slow reactions among commercial drivers. The realisation that RTIs were on the increase brought about the introduction of strategies such as road safety education to prevent injuries and fatalities which result from alcohol – impaired driving (WHO, 2004).

2.2.4 Driving Experience and Road Safety Driving Behaviour

Researchers have also carried out different studies to determine the relationship between age and experience. Such studies have shown that crash rates reduce with experience; while they are higher for novice adolescent drivers (16-19 years), they are lesser for novice adult drivers (20 years+) (Mayhew, Simpson and Pak, 2003; Gregersen and Bjurulf, 1996). Another related study was carried out by Curry, Mirman and Kallan (2012). The study examined passenger effects on adolescent drivers' ages 16-18 years, and provided further insight into the mechanisms that underlie the effects of peer passengers' ages 14-20 years. It discovered that male drivers were more likely to engage in aggressive and other unsafe driving practices when driving with passengers. Other related studies include Shepherd, Tapscott, and Gentile, (2011) and Ouimet, Pradhan and Simons-Morton (2013).

2.3 Theoretical Framework

2.3.1 Social Cognitive Theory

The social cognitive theory (SCT) is also known as the social learning theory It was proposed by Miller and Dolland in 1941 and Broadened in 1963 by Bandura and Walters with the principle of observational learning and vicarious reinforcement. The unique feature of SCT is the emphasis on social influence and its emphasis on external and internal social reinforcement. SCT considers the unique way in which individuals

acquire and maintain behaviour, while also considering the social environment in which individual perform the behaviour. The theory takes into account a person's past experience, which factor into whether behavioural action will occur. These past experience influences reinfrocements, expectations, and expectances, all of which shape whether a person will engage in a specific way behaviour and the reason why a person engages in that behaviour.

However, the goal of SCT is to explain how people regulate their behaviour through control and reinforcement to achieve goal-directed behaviour that can be maintained over time. The first five constricts were developed as part of the social learning theory; the constrict of self-efficacy was added when he theory evolved into SCT.

1) Reciprocal Determinism: This is the central concept of SCT. It refers to the dynamic and interaction of person (individual with a set of learned experiences), environment (external social context) and behaviour (responses to stimuli to achieve goals).
2) Behavioural capacity: This refers to a person's actual ability to perform a behaviour, a person must know what to do and how to do it. People learn from the consequences of their behaviour, which also affects the environment in which they live.
3) Observational learning: This expresses that people can witness and observe a behaviour conducted by others, and then reproduce those actions. This is often exhibited through "modeling" of behaviours. If individuals see successful demonstration of a behaviour, they can also complete the behaviour successfully.
4) Reinforcements: This refer to the internal and external responses to a person's behaviour that affect the likelihood of continuing or discontinuing the behaviour. Reinforcement can be self-initiated or in the environment, and reinforcement can be positive or negative. This is the construct of SCT that most closely ties to the reciprocal between behaviour and environment.
5) Expectations: This refers to the anticipated consequences of a person's behaviour. Outcome expectations can be health-related or not health-related. People anticipate the consequences of their actions before engaging in the behaviour and these anticipated consequences can influence successful completion of the behaviour. Expectations derive largely from previous experience while

expectancies also derive from previous experience, expectancies focus on the value that is placed on the outcome and are subjective to the individual.

6) Self-efficacy: This refers to the level of a person's confidence in his or her ability to successfully perform a behaviour. Self-efficacy is unique to SCT. It is influenced by a person's specific capabilities and other individual factors, as well as by environmental factors (barriers and facilitators (Lamorte, 2018).

The SCT is relevant to this study into two ways. First, it establishes that an inter-commercial minipus driver in Ibadan metropolis acquire unsafe driving behaviour through their interactions with other drivers in the motor park. The unsafe driving behaviour is characterised by driving under the influence of drugs and alcohol, over speeding, distracted driving (eating, drinking, listening to radio and talking on a phone), driver's fatigue and disobeying traffic regulations. However, the driver's experience in the unsafe driving behaviour, motor park environment where drugs and alcohol are easily accessible and the benefits (of performing the behaviour) motivates him maintain such behaviour. For example, an inter-state commercial mini-bus driver's choice of over speeding largely depends on the expected cost of speeding and expected benefit associated with it. Further to the monetary benefit accruing from the time saved, one major intrinsic benefit of over-speeding among the inter-state commercial minibus drivers is the trill. The second way through which the theory is relevant to this study is that it provides the opportunities for change in the unsafe behaviour through the multimedia-based road safety education that is capable of enhancing participants' self-efficacy observational learning, motivation and expectation. The behaviour change that would be achieved includes avoiding over speeding and driving under the influence of drugs and alcohol and obeying traffic regulations.

2.4 Applying Bandura's Social Cognitive Theory to Safe Driving Behaviour of Inter-state Commercial Mini-bus Drivers

This model was proposed to help commercial minibus drivers understand how unsafe driving behaviour could be acquired and maintained. The model followed Bandura's social cognitive theory to guide its development and describes the influence of individual experiences, the actions of others and environmental factors on individual behaviour. The theory provides opportunities for social support through instilling self-efficacy and using observational learning and other reinforcement to achieve behaviour change.

The inter-state commercial minibus drivers, as shown in Figure 2.5 engage in unsafe driving behaviour through their interactions with their environment that is characterised by other inter-state commercial minibus drivers, every accessibility to drugs and alcohol and high incidence of unsafe driving behaviour. However, unsafe driving behaviour is characterized by driving under the influence of drugs and alcohol, over speeding, distracted driving and disobeying traffic regulations. These are influence by the drivers experiences. The drivers' experiences constitutes knowledge about and attitude towards safe driving. The drivers maintain the unsafe driving because of the benefits (expectations) they derive from it. For example, an inter-state commercial minibus driver chooses to engage in over-speeding because of the monetary benefit and the thrill associated with driving and speeding.

However, multimedia-based road safety education aim at helping the drivers as developed the grounds on the principles of the constricts of the social cognitive theory such as self-efficacy, observational learning and reinforcement. The multimedia-based road safety education has components such as conceptualizing road traffic accidents (RTAs), motion management techniques principles of defensive driving, techniques for driving under special conditions, techniques for driving on the expressway and first aid treatment. The purpose of the multi-based road safety education is to achieve behaviour change characterized by avoiding driving under the influence of drugs and alcohol, over-speeding and distracted driving and obeying traffic regulations.

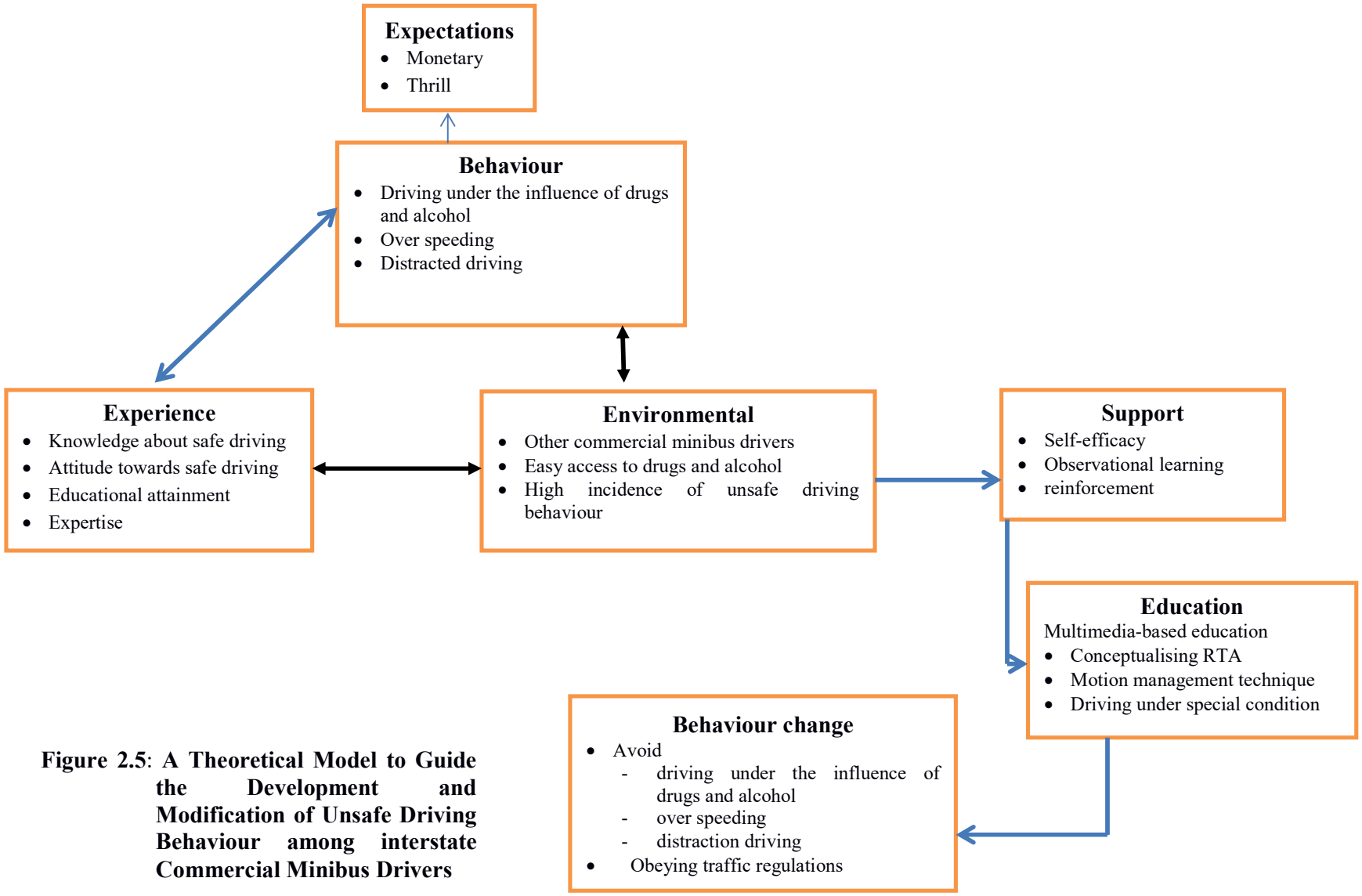

Figure 2.5: A Theoretical Model to Guide the Development and Modification of Unsafe Driving Behaviour among interstate Commercial Minibus Drivers

Author: Mabayoje, E. D. Social Cognitive Theory Adopted and Modified from Bandura's Social Cognitive Theory (1997)

2.5 Conceptual Framework for the Study

The conceptual framework for this study as presented in figure 2.6 was derived from the multimedia-based road safety education used in the study. The framework shows that independent variable is the multimedia-based road safety education that was used in the study. The moderating variables are educational attainment and driving experience. However, the educational attainment of the participants varies as educated and non-educated. Their driving experience also varies high moderate and low. They intervene with the effect of the independent variable. The dependent variables are the result and the ultimate goals of the research which in this case are the enhanced knowledge of and attitude to safe driving behaviour which should lead to avoiding driving under the influence of drugs and alcohol, over-spending and distracted driving, and obeying traffic regulations. The behavioural equation S-O-R represents the total interaction of the variables in the study.

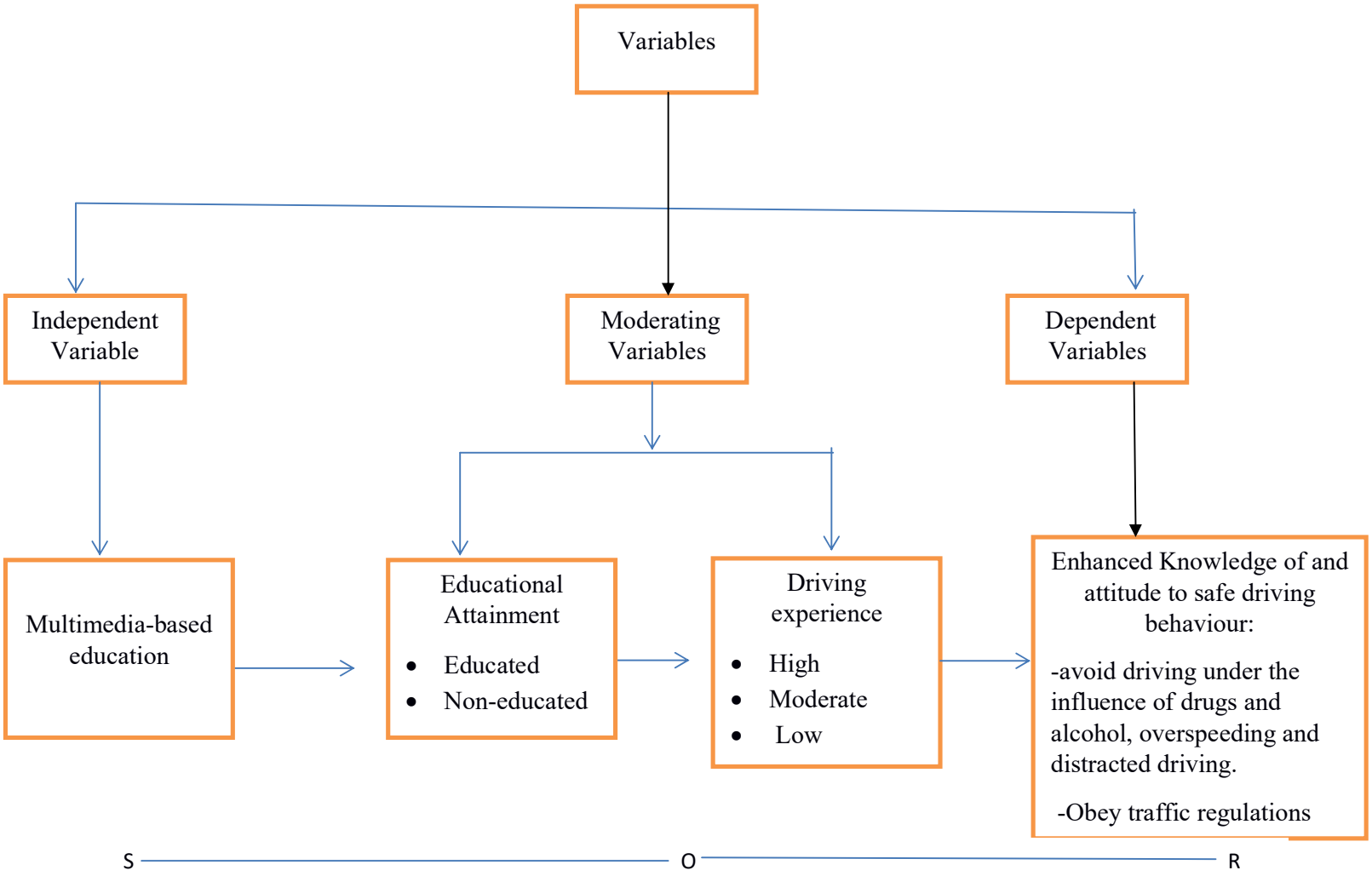

Figure 2.6: Conceptual Framework for the study

Key:
S = Stimulus (Independent Variable)
O = Organism (Factors inherent in the organism which are moderating variables
R = Response (Dependent variable, that is, the resultant effect of the independent variable)

2.6 Appraisal of literature

In the literature, RTA is a major public health difficulty and leading cause of death and injury around the world. Everyday around the world, more than 3000 people die from RTIs (road transport injuries). Statistics from many developing countries showed that the incidences and causes of RTAs vary with geographical location. In Nigeria, many lives have witnessed about five-fold increase in records of traffic related deaths over the decades. Furthermore, annually, over one million deaths are recorded worldwide, approximately 50 million injured every year come from Asia and African countries. Many people are coping with mortality or morbidity of family members from road transport injuries (RTIs). As a result, many are placed in a heavy burden of household finances, whereby their families are driven deeply into lack by loss of breadwinners and the added burden of caring for members who are disabled.

The literature also reveals that the causes of RTAs are multi-factorial. In Nigeria, the contributing factors include road itself (environmental factor), the driver (human factor) and the vehicle (mechanical factor). On these three factors, human factor constitute about 90% of road traffic casualities. Out of this percentage, driver's action or reaction make up 80%. According to the literature, human factor is characterised by over speeding, tiredness, driving under the influence of alcohol, distractions and disobeying traffic rules. In the literature, one of the main objectives of the Federal Road Safety commission (FRSC) is the instruction on and enforcement of road traffic rules and regulations. Thus, the establishment of the FRSC in 1988 was aimed at enlightening Nigerians on road safety and crash prevention matters. It is fashioned to consolidate and advance on the gains so far made by the FRSC in better road management and instilling sanity on our roads. Specifically, the communication is established with the objectives of promoting safe driving in Nigeria.

Most studies in the literature focus on the effectiveness of road safety campaigns. The main objective of road safety campaign is to deter drivers from unsafe driving behaviour through persuasion (by providing information to drivers about the aftermaths of overspeeding and driving under the influence of drugs). Such campaigns are prevalent in the country, but drivers, particularly commercial bus drivers continue to regard, for example, speeding and driving under the control of drugs as socially acceptable behaviours. Smoking, drinking and driving against the official speed limit persist as the norms among this group of drivers. An explanation for the apparent ineffectiveness of the road safety campaigns is possibly because they are often based on intuition rather than being grounded in the principle of behaviour change. It is on this basis that the study sought to look at the effects of multimedia-based

road safety education on knowledge and attitude to safe driving behaviour of interstate commercial mini-bus drivers in Ibadan metropolis, Nigeria.

CHAPTER THREE
METHODOLOGY

3.1 Research Design

A 2x2x3 pretest-posttest control group, quasi experimental design was adopted for the study. The purpose is to examine the efficacy of the road safety education on knowledge of and attitudes towards safe driving behaviour among inter-state commercial minibus drivers in Ibadan. The design is diagrammatically illustrated below:

Figure 3.1: Schematic Representation of the Research Design

O_1 X_1 O_2 ……. (E)

O_3 X O_4 ……. (C)

Where X_1 = Treatment (Multimedia-based road safety education)

X_2 = Treatment (Education on road traffic accident)

E = Experimental group

C = Control group

O_1 O_2 = Pre-test measurement

O_2 O_4 = Post-test measurement

3.2 Variables in the Study

Independent variable – mode of instruction

- Road Safety Education
- Control

Moderating Variables

- Educational Attainment
  - Educated
  - Non-Educated

Driving Experience

- High
- Moderate
- Low

Table 3.1: 2 x 2 x 3 Factorial Design for the study

Treatment	Driving Experience	Educational Attainment	
		Educated	**Non-Educated**
Multimedia based Road Safety Education	High		
	Moderate		
	Low		
Control Group	High		
	Moderate		
	Low		

From the above design (Table 3.1), the treatment conditions (A), that is, the experimental treatment condition namely, multimedia-based road safety education and the control group (A2) form the row. The educational attainment (B) factor variant two levels; educated (B1) and non-educated (B2), and the driving experience factor varying at three levels; high, moderate and low form the columns. There are twelve cells and the number of participants in each cell is the value of n.

3.3 Population of the study

The population for the study comprised inter-state commercial minibus drivers in the Motor parks of Ibadan metropolis.

3.4 Sample and sampling technique

Two motor parks (Iwo-Road – Control and Ojoo – Multimedia-based road safety education, (MbRSE), with multi-stop routes were purposively selected in Ibadan metropolis. Seventy-eight drivers, with records of risky driving behaviour, who scored 18 and above in the screening were purposively selected from the two motor parks. The participants were assigned at random to MbRSE (41) and control group (37).

Inclusion criteria

The participants were required to satisfy each of the following criteria before they could be assigned into the two experimental groups (treatment and control).

- They should exhibit symptoms of RDB (Risky Driving Behaviour) Scale Score of 18 and above.
- They should be inter-state commercial minibus drivers.
- They should have valid driver's license
- They should be registered members of the NURTW

3.5 Instrumentation

The main instruments used for data collection were of four sets. These are Knowledge about Safety Driving Behaviour Test (KSDBT), Attitude Towards Safe Driving Behaviour Rating Scale (ASDBRS), Risky Driving Behaviour Rating Scale (RDBRS) and Driving Experience Rating Scale. (DERS)

A. Knowledge about Safe Driving Behaviour Test (KSDBT)

This instrument was developed by the researcher. It is a 35 item self-reported test designed to assess the level of knowledge about safe driving behaviour among commercial minibus drivers. Each item was selected from among the following categories: speeding, seatbelt use, reversing, take-off, defensive and expressway driving, driving under the control of drugs, road traffic signals, signs and markings, driving under special conditions, and emergency and rescue. The items require the respondents to choose the most appropriate response from the options provided. However, the correct response was awarded two points while the incorrect response was awarded zero point.

The instrument was validated through comments from experts. That is, experts in test construction went through the test, and useful suggestions made were adequately considered. The reliability of the instrument was determined through the test-retest method. This involved the administration of the instrument on 15 inter-state commercial minibus drivers (other than those that were involved in the study) on two occasions of three weeks interval. The KSDBT's internal consistency estimates yielded a mean coefficient alpha of 0.62.

B. Attitude towards Safe Driving Behaviour Rating Scale (ASDBRS)

This scale was developed by the researcher to assess the driver's behaviours associated with safe driving. It consists of twenty test items which require the respondents to rate themselves on a 4-point Likert Scale of 'Strongly Agree', 'Agree', ''Disagree and 'Strongly Disagree'. These were graded as 4, 3, 2 and 1 respectively (except for the negative test items where the grading was reversed).

The instrument was validated by means of an internal method of validation. Experts in test construction went through the test and gave useful suggestions to adequately consider. The reliability of the instrument was determined through the test-retest method. This involved the administration of the instrument on 15 inter-state commercial minibus drivers (other than those that were involved in the study) on two occasions of three weeks interval. The ASDBRS' internal consistency estimates yielded a mean coefficient alpha of 0.68.

C. Risky Driving Behaviour Rating Scale (RDBRS)

This scale was also constructed by the researcher to determine the RDBs of commercial vehicle drivers. It consists of ten (10) test items which require the respondents to rate themselves on a 4- point scale of 'Strongly Agree' 'Agree' 'Disagree' and 'Strongly Disagree'. These were graded as 4, 3, 2, and 1 respectively (except for negative test items where the grading was reversed).

The instrument was validated through comments from experts, that is experts in test construction went through the test and made useful suggestions for consideration. The reliability of the instrument was determined through the test-retest method. This involved the administration of the instrument on 15 inter-state commercial minibus drivers (other than those that were involved in the study) on two occasions of three weeks interval. The RDBRS' internal consistency estimates yielded a mean coefficient alpha of 0.64.

D. Driving Experience Rating Scale (DERS)

This scale (DERS) was made by the researcher. It consists of 12 test items designed to assess the level of driving experience among commercial minibus drivers. Each test was selected from among the following categories: skills required for expressway driving, driving under special conditions, reversing, attending to road hazards, speed limit, road traffic signals, signs and markings, and seatbelt use. The items require the respondents to choose the most appropriate response from the options provided. However, the correct response was awarded two points while the incorrect response was awarded zero point.

The instrument was validated through comments from experts, that is, experts in test construction went through the test and useful suggestions made were adequately considered. The reliability of the instrument was determined through test-retest method. This involved the administration of the instrument on 15 inter-state commercial minibus drivers (other than those that were involved in the study) on two occasions of three weeks interval. The DERS' internal consistency estimates yielded a mean coefficient alpha of 0.67.

Demographic information

This was made by the researcher to gather data on participants' demographic characteristics such as age, educational attainment, marital status, state of origin, nationality, ownership of the vehicle, route, years of driving experience, channel of acquiring driving skills and religion.

3.6 Procedure for Data Collection

This was carried out in three phases as follows

- Pre-treatment phase;
- Treatment; and
- Post-treatment Evaluation Phase

Pre-treatment phase

First, the researcher obtained a letter of introduction from the Head of Department, Adult Education. This letter enabled him gain entry into the two motor park locations in Ibadan metropolis. Thereafter, the N.U.R.T.W, Oyo State Chapter was contacted with the letter and the goals of the study were discussed with them**.** In collaboration with the N.U.R.T.W executive members, the two motor parks involved in the study were contacted and those who wished to participate in the study were assembled in the motor park premises. After ensuring that they were well seated, the purpose of the study was discussed with them, and they were assured that any information given would treated with strict confidentiality. No other work was done that day. On the next day of appointment, the drivers were assembled in the motor park premises and the previous activities were recapped with them. Following this was the screening of the drivers for the study eligibility; the researcher then negotiated with the participants that met with the study eligibility for the convenient environment and week days when training sessions could be fixed.

3.7 Treatment sessions

These were the actual training sessions. The first thing was the administration of KSDBT and ASDBRS to the two groups for the purpose of obtaining pretest scores. The Driving Experience Rating Scale (DERS) was also administered to classify the participants into the three driving experience levels (high, moderate and low). Thereafter, those in the experimental group were subjected to 8 weeks of the treatment protocol. Those in the control

group participated for 8 weeks. There was a session of training each week and each session lasted for about 50 minutes. The participants in the experimental group were managed with multimedia-based road safety education (MbRSE). Those participants in the control group were exposed to Road Traffic Accident (RTA) education.

The treatment component for the experimental group is based on social cognitive theory proposed by Bandura (1997). The treatment component consists of eight 50-minutes weekly sessions that enabled the inter-state commercial minibus drivers improve on their knowledge and attitude towards safe driving behaviours. The techniques in the treatment include motion management (speed limit, concentration, obeying traffic rules and regulation, avoidance of drunk driving technique), principles of defensive driving, techniques for driving under special conditions and first aid and casualty handling strategies. These were delivered through the application of technological tools such as video slides, film shows, documentary, posters, handbills and lectures.

The package for the control group consists of RTA education. The treatment protocol consists of eight 35-minutes weekly sessions that enabled the participants to be aware of the trend, causes and consequences of RTAs in Nigeria. The activities include an overview of RTAs in Nigeria, human factor and RTAs in Nigeria, physiological, social, economic and psychological consequences of RTAs in Nigeria. It lacks any strategy that can be employed for improving knowledge and attitude towards safe driving behaviours of interstate commercial minibus drivers. It is delivered through lectures.

Table 3.2 Schedule of Activities for Experimental Group

Weeks	Theme	Objectives	Activities	Materials
1	Orientation and administration of pre-test measure.	At the end of the session: (1) the researcher and the participants should have been familiar with one another; (2) the researcher should have obtained the pretest scores from the participants.	• The researcher introduces himself and asks for the introduction of others (participants) • The researcher and the participants establish rapport and set the ground rule. • The researcher administers the pretest measure to the participants. • The participants give information as directed by the measure.	Writing materials (pencil, erazer, biro pen).
2	Conceptualising RTAs	At the end of the session, participants should be able to: (1) discuss causes of RTAs in Nigeria (2) identify pattern of RTAs in Nigeria (3) identify consequences of RTAs in Nigeria	• The researcher reviews the previous activities with the participants. • With assistance of the Federal Road Safety Corps (FRSC) officials, the researcher (1) discusses causes of RTAs in Nigeria, (2) presents cases of RTAs (state by state), and (3) discusses consequence of RTAs in Nigeria with reference to commercial mini-bus drivers. • The participants act as directed by the researcher	Video slides, film shows, documentary, posters and handbills of RTA on Nigerian roads and victims.
3	Motion Management Techniques	At the end of the session, participants should be able to discuss basic principles of safe driving including actions to be taken before, during and after take-off,	• The researcher reviews the previous activities with the participants. • With the assistance of FRSC officials, the researcher discusses and demonstrates actions to be taken before, during and after take-off.	Video show and documentary on some principles of safe driving.

		braking, overtaking, u-turn and decent parking.	• He discusses and demonstrates basic rules for braking, overtaking, u-turn and decent parking. • The participants demonstrate as directed by the researcher.	
4	Principles of defensive driving	At the end of the session, participants should be able to: (1) identify road traffic signs and symbols, and (2) discuss qualities of a defensive driver with specific reference to traffic rules and regulations.	• The researcher reviews the previous activities with the participants. • With the assistance of FRSC officials, the researcher displays various road signs and symbols. • He discusses qualities of a defensive driver with specific reference to road traffic rules and regulations. • The participants act as directed by the researcher.	Flash cards, documentary and video slides on road traffic signs and symbols.
5	Techniques for driving under special conditions.	At the end of the session, participants should be able to (1) identify special conditions associated with driving, including night driving, driving in the rain, harmattan haze, foggy weather and convoy, and (2) discuss the skills required for driving under these conditions.	• The researcher reviews the previous activities with the participants. • With the assistance of FRSC officials, the researcher highlights special conditions associated with driving. • He discusses the skills required for driving under these conditions. • The participants act as directed by the researcher.	Video show of vehicles moving under special conditions associated with driving

6	Techniques for driving on the expressway.	At the end of the session, participants should be able to discuss: (1) strategies for entering and leaving the expressway maximum speed limits; (2) principles guiding expressway driving; and (3) various restrictions on the expressway.	• The researcher reviews the previous activities with the participants. • With the assistance of the FRSC, the researcher discusses strategies for entering and leaving the expressway. • He discusses the principles guiding expressway driving. • He presents various restrictions on the expressway. • The participants act as directed by the researcher.	Video show on expressway driving.
7	First aid treatment.	At the end of the session, participants should be able to: (1) mention four categories of casualties; and (2) role-play care that can be given to victims involved in RTAs.	• The researcher reviews the previous activities with the participants. • With the assistance of the FRSC officials, the researcher discusses four categories of casualty. • He role-plays care that can be given to victims involved in RTAs. • The participants act as directed by the researcher.	Video slides and documentary on categories of casualty.
8	Administration of posttest measure and termination of training sessions.	At the end of the session, the researcher should have obtained posttest scores from the participants.	• The researcher recaps on the major activities performed throughout the training sessions. • He administers the posttest measure to the participants. • The participants discuss the things they benefit from the training sessions. • The researcher thanks the participants and terminates the training sessions.	Writing materials.

Table 3.2 Schedule of Activities for Control Group

Weeks	Theme	Objectives	Activities	Materials
1	Orientation and administration of pre-test measure.	At the end of the session: (1) the researcher and the participants should have been familiar with one another; (2) the researcher should have obtained the pretest scores from the participants.	• The researcher introduces himself and asks for the introduction of others. • The researcher and the participants establish rapport and set the ground rule. • The researcher administers the pretest measure for the participants. • The participants gave information as directed by the measure.	Writing materials (pencil, eraser, biro pen).
2	An overview of RTAs in Nigeria.	At the end of the session, participants should be able to: (1) define RTAs (2) identify factors responsible for RTAs in Nigeria (3) discuss pattern of RTAs in Nigeria.	• The researcher reviews the previous activities with the participants. • With much assistance from Federal Road Safety Corps (FRSC) officials, the researcher: (1) defines RTAs; (2) discusses factors responsible for RTAs in Nigeria, and (3) discusses cases of RTAs (state by state). • The participants act as directed by the researcher	Writing materials (pencil, eraser, pen, jotting sheets)
3	Human factors and RTAs in Nigeria.	At the end of the session, participants should be able to highlight the contribution of the drivers to RTAs, including overspeeding, lack of concentration, driving under the influence of drugs	• The researcher reviews the previous activities with the participants. • He discusses contributions of the drivers to RTAs. • The participants act as directed by the researcher.	Writing materials

		and alcohol, dangerous traffic rules and regulations, and poor vehicle care.		
4	Physiological consequences of RTAs in Nigeria.	At the end of the session, participants should be able to discuss physiological effects of RTAs among commercial mini-bus drivers, including brain and spinal cord injuries, limb damages (physical disability), and persistent pains.	• The researcher reviews the previous activities with the participants. • He discusses physiological effects of RTAs with specific reference to brain and spinal cord injuries, limb damages, and persistent pains. • The participants act as directed by the researcher.	Writing materials
5	Social consequences of RTAs in Nigeria.	At the end of the session, participants should be able to discuss social consequences of RTAs among commercial minibus drivers, including loss of life, absence from work, neglect, stigma, and distortion in family relationship	• The researcher reviews the previous activities with emphasis on the concept of RTAs in Nigeria. • He discusses social consequences of RTAs with specific reference to loss of life, absence from work, neglect, stigma and distortion in family relationship. • The participants act as directed by the researcher.	Writing materials
6	Economic effects of RTAs in Nigeria.	At the end of the session, participants should be able to discuss economic impact of RTAs among commercial minibus workers, including loss of properties, vehicle damage, job loss, financial hardship and disrupted	• The researcher reviews the previous activities with emphasis on the concept of RTA in Nigeria. • He discusses economic consequences of RTAs with specific reference to loss of properties, vehicle damage, job loss and financial hardship and disrupted parenting..	Writing materials

		parenting.	• The participants act as directed by the researcher.	
7	Psychological impacts of RTAs in Nigeria.	At the end of the session, participants should be able to discuss psychological effects of RTAs among commercial minibus drivers, including depression and anxiety.	• The researcher reviews the previous activities with emphasis on the concept of RTAs in Nigeria. • He defines depression and discusses causes and consequences of depression associated with RTAs. • The participants act as directed by the researcher.	Writing materials
8	Administration of posttest measure and termination of training sessions.	At the end of the session, the researcher should have obtained posttest scores from the participants.	• The researcher recaps on the major activities performed throughout the training sessions. • He administers the posttest measure to the participants. • The participants discuss thing they benefit from the training sessions. • The researcher thanks the participants and terminates the training sessions.	Writing materials.

Post treatment Phase

This involved the administration of KSDBT and ASDBRS for data collection from the two treatment groups.

Control of Extraneous Variables

In order to control the extraneous variables such as participants, researcher variable, temporal variables, method and technique variables and environmental variables which can affect the study, the under-listed approaches were applied.

1. Allocation of the two motor parks into the experimental and control groups through simple random sampling technique.
2. Distribution of the trainees into the experimental group and the control group through purposive sampling technique.
3. Use of the inclusion criteria stated in this study.
4. Use of the experimental design with 2x2x3 factorial matrix.
5. Use of Analysis of covariance (ANCOVA)
6. Prevention of leakage of training materials through distancing of the two groups.

3.7 Methods of data analysis

Data collected from the biodata questionnaire were collated and analysed using descriptive statistics with percentages and pie-charts. Also, data obtained for testing the seven hypotheses were computed and analysed using ANCOVA to examine the effect of treatment, educational attainment and driving experience on the dependent variables. Where significant difference was obtained, Multiple Classification Analysis (MCA) was used to ascertain the source of significance and value the amount of fluctuation due to each independent variable (treatment).

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

This chapter gives the results of data analysis. The first aspect of the presentation focused on the demographic information of the participants. These included participants' age, religion, educational attainment, ownership of the vehicle, years of driving (experience) and driving skills acquisition. The other part focused on discussion of findings on the effects of road safety on participants' knowledge about and attitude towards safe driving behaviours.

4.1 Demographic information of participants

The demographic information of the participants consisted of age, religion, educational attainment, ownership of the vehicle, years of driving experience and driving skills acquisition.

4.1.1 Distribution of participants by age

The distribution of participants' characteristics feature based on age is given in Figure 4.1.1.

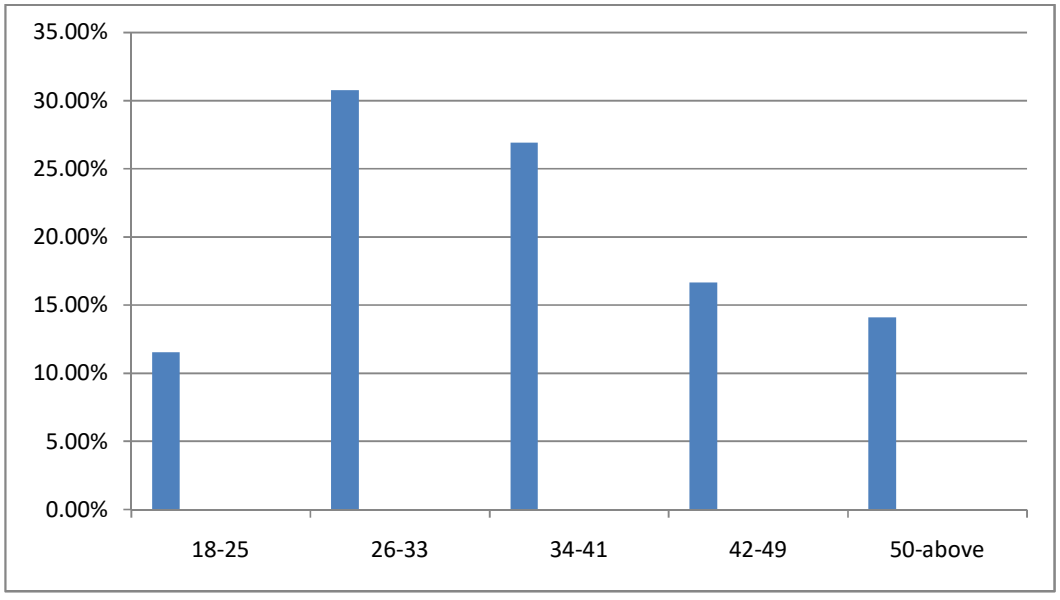

Figure 4.1.1: Frequency Counts Showing the Participants' Age

Source: Survey Data, 2016

Figure 4.1.1 showed the distribution of participants by age. Majority of the participants (30.77% and 26.92%) were between 26-33 years and 34-41 years

respectively, while a significant number of participants were between 42-49 years (16.67%) and 50 years and above (14.10%). A few (11.54%) of the participants were between 18-25 years. The implication that can be drawn from the distribution is that the majority of interstate commercial mini-bus drivers were younger and middle ages categories. This enabled the researcher obtain information about knowledge and attitude of the drivers towards safety driving behaviours without much problem.

4.1.2 Distribution of participants by religion

The distribution of participants characteristics feature based on religion is presented in Figure 4.1.2.

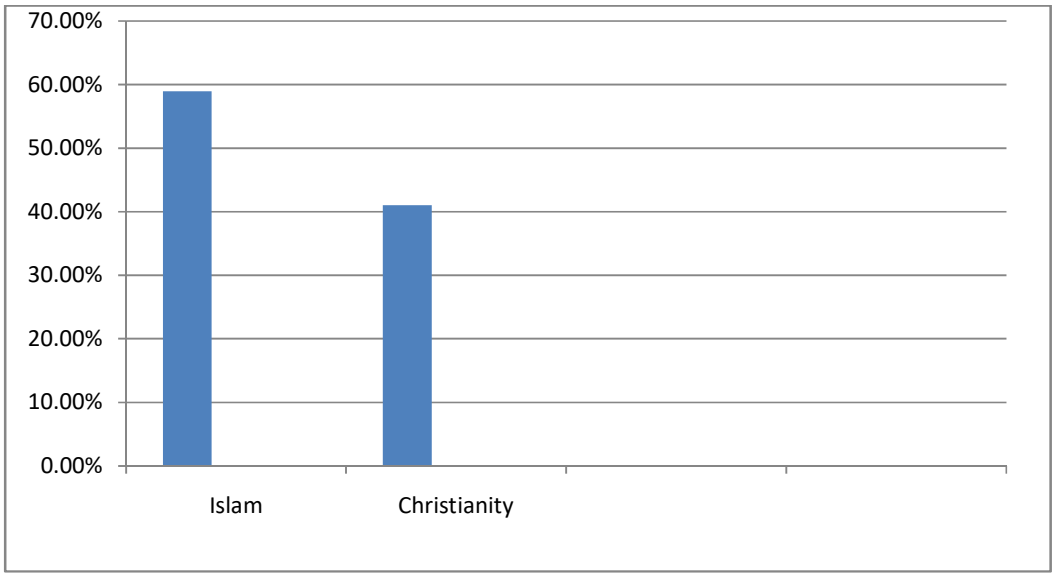

Fig. 4.1.2: Frequency Counts Showing the Participants' Religion
Source: Survey Data, 2016

Figure 4.1.2 showed the distribution of the participants by religion. From this figure, the majority (58.97%) of the participants were Muslims, while a significant number (41.03%) were Christians. The implication that can be drawn from the distribution is that Muslims engage in interstate commercial minibus driving than Christians. This could be responsible for having the number of participants that met the study eligibility without experiencing any stress.

4.1.3 Distribution of participants by level of educational attainment

The distribution of participants' characteristics feature based on educational attainment is presented in Figure 4.1.3.

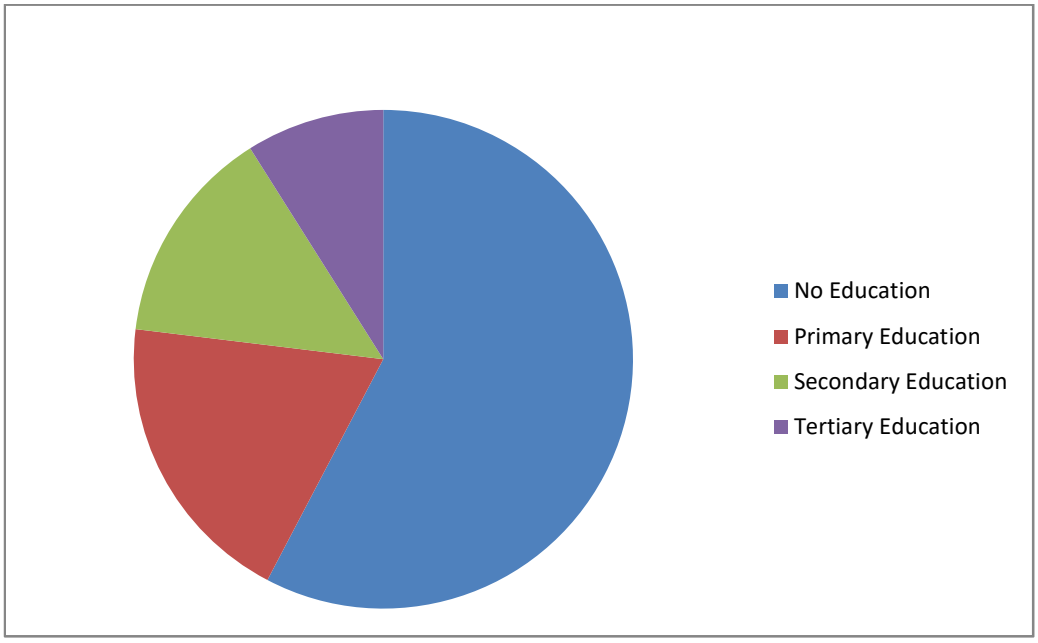

Fig. 4.1.3: Frequency Counts Showing the Participants' Level of Educational Attainment

Source: Survey Data, 2016

Figure 4.1.3 showed the distribution of the participants' level of educational attainment. It showed that many of the participants (57.69%) were non-educated while a significant number (19.23%) had primary education. A very few (14.11% and 8.97%) had secondary and tertiary education. The implication that can be drawn from the distribution is that non-educated and holders of primary education engage in interstate commercial minibus driving than holders of secondary and tertiary education. Thus, the success of the training programmes rests on the language of the participants and a factor for conducting the session in the mother language.

4.1.4 Distribution of participants by years of driving experience

The distribution of participants' characteristics feature based on years of driving experience is presented in Figure 4.1.4.

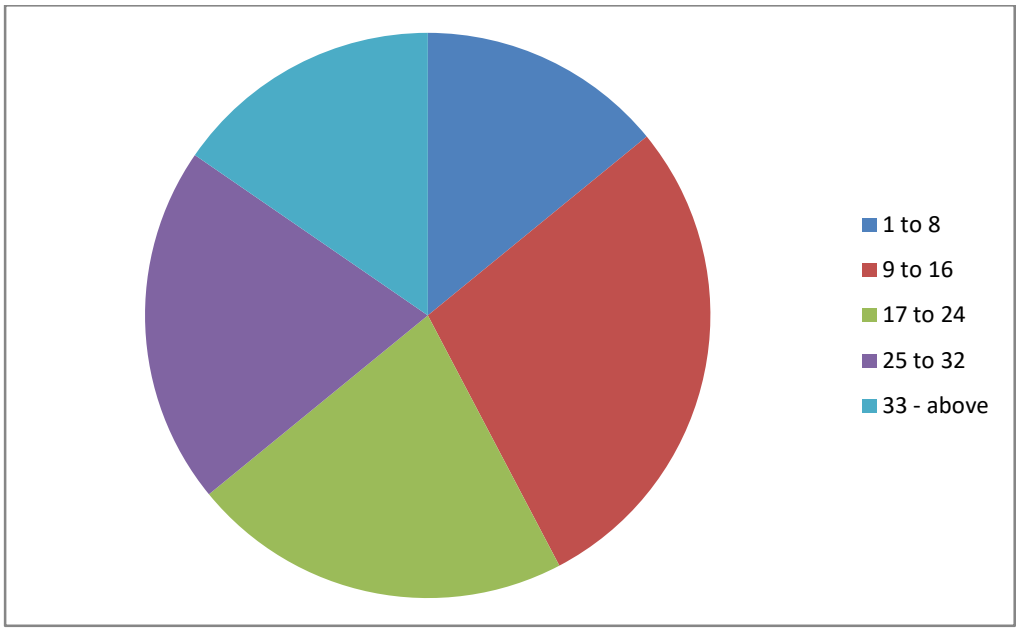

Fig. 4.1.4: Frequency Counts Showing the Participants' Years of Driving Experience
Source: Survey Data, 2016

Figure 4.1.4 revealed the distribution of the participants by years of driving experience. From this figure, majority of the drivers in training (28.20%, 21.79% and 20.51%) were between 9-16, 17-24 and 25-32 years of driving experience respectively. However, a few (14.10% and 15.40%) of the participants were between 1-8 and 33 and above years of driving experience respectively. The implication that can be drawn from this distribution is that the majority of the interstate commercial minibus drivers had fairly high years of driving experience. This is a factor that information collected for the study on the knowledge and attitude of the drivers towards safe driving behaviour in Ibadan metropolis came from a reliable source.

4.1.5 Distribution of participants by acquisition of driving skills channel

The distribution of participants' characteristics feature based on channel of acquiring driving skills.

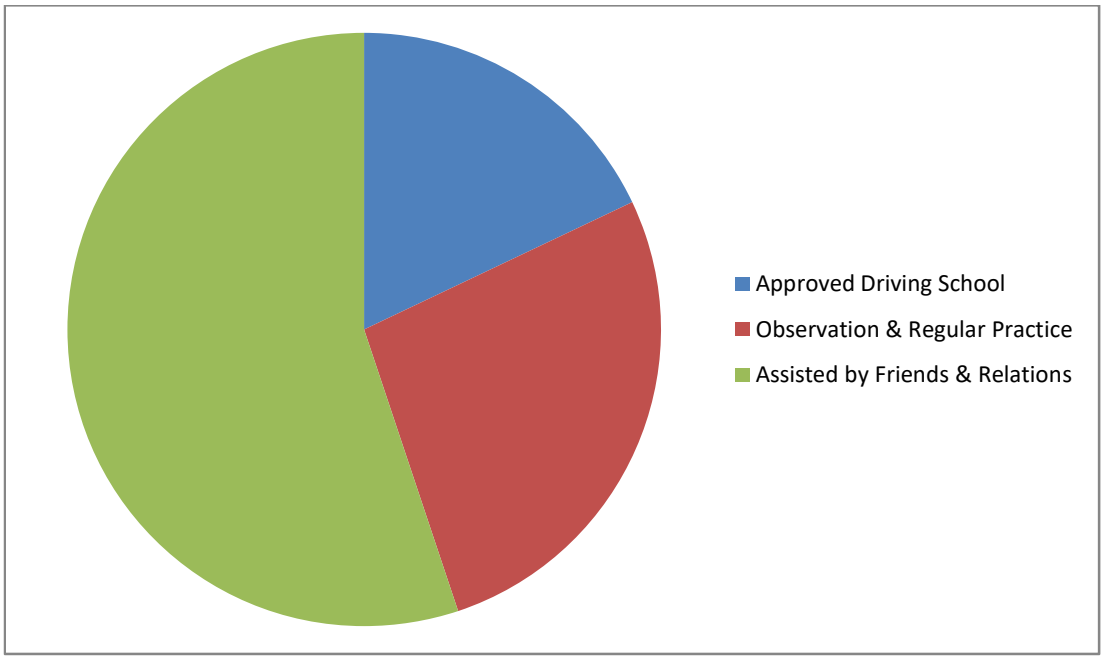

Fig. 4.1.5: Frequency Counts Showing the Participants' Channel of Acquiring Driving Skills

Source: Survey Data, 2016

Figure 4.1.5 showed the distribution of the participants by means of acquiring driving skills. From this figure, the majority of the participants (55.13%) acquired driving skills through friends and relations while a significant number of the participants (26.92%) acquired the skills by observing other drivers and regular practice. A very few (17.95%) acquired driving skills through driving schools. The implication that can be drawn from this distribution is that majority of interstate commercial minibus driver had never attended any driving school for the purpose of acquiring driving skills. This is factor for the importance of the research to the participants. That is, the need to employ road safety education for the purpose of enhancing their knowledge and attitude to safe driving behaviour of the driver is very crucial.

4.1.6 Distribution of participants by ownership of the vehicle

The distribution of participants' characteristics feature based on the ownership of the vehicle is presented in Figure 4.1.6.

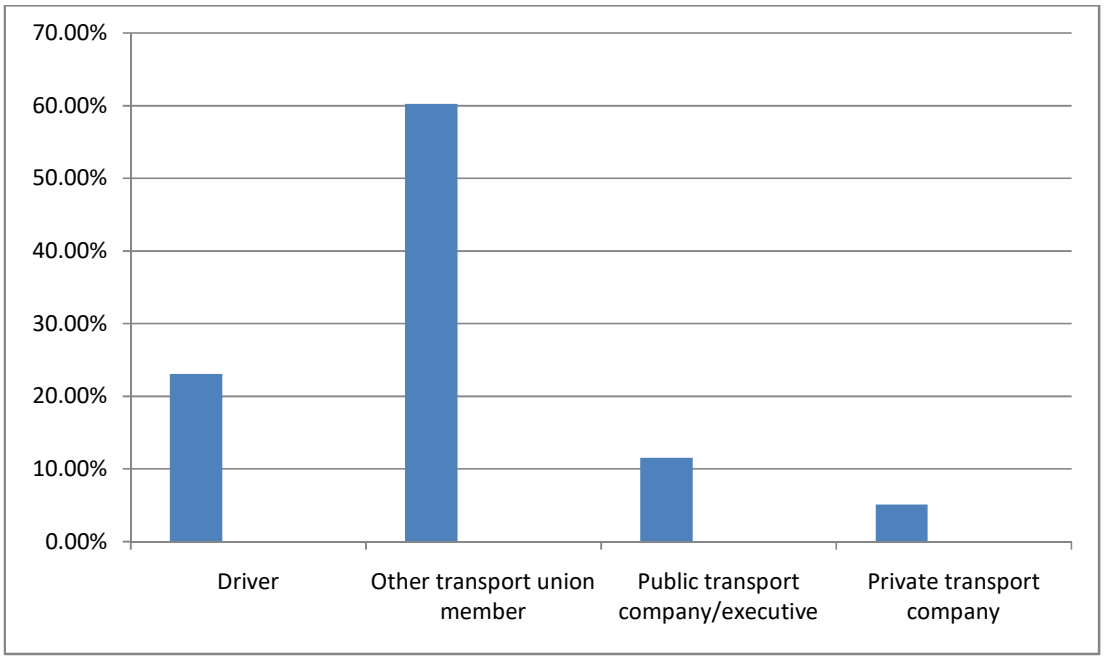

Fig. 4.1.6: Frequency Counts Showing the Participants' Ownership of the Vehicle
Source: Survey Data, 2016

Figure 4.1.6 showed the distribution of the participants by the ownership of the vehicle. From this figure, many of the participants (23.08% and 60.25%) indicated driver and other transport union member/executive as owners of the vehicle. However, a few participants (5.13% and 11.54%) indicated private transport company and public transport company/scheme respectively as owners of the vehicle. The implication that can be drawn from the distribution is that the majority of interstate commercial mini-bus are owned by transport union executives and active members. This is a factor for having access to the participants without much problem.

4.2 Testing of hypotheses

To determine the effects of road safety education on knowledge and attitude to safe driving behaviour among interstate commercial minibus drivers in Ibadan metropolis, Nigeria, the study was directed by certain hypotheses. However, this section provided results of the study.

Hypothesis One ($H0_1$)

There is no significant main effect of treatment on participants'

(a) knowledge about, and

(b) attitude to safe driving behaviour

(a) Knowledge about safe driving behaviour

$H0_1$ (a): There is no significant main effect of treatment on participants' knowledge about safe driving behaviour.

To test this hypothesis, analysis of covariance was employed to analyze the post test scores of the participants on their level of knowledge about safe driving behaviour using the pretest scores as covariance to ascertain if the post experimental differences are statistically significant. The abridged account of the analysis is given in the Table below;

Table 4.1: Analysis of Covariance of Knowledge about Safe Driving Behaviour Scores by Treatment, Educational Attainment and Driving Experience

Source	Sum of Squares	Df	Mean Square	F	Sig.	Eta Squared
Corrected Model	8523.134	8	1065.391	537.391	.000	.794
Intercept	215.610	1	215.610	46.669	.000	.304
Main Effects						
Treatment group	622.230	1	622.230	67.342	.000	.557
Formal education	10.730	1	10.730	2.323	.030	.121
Driving Experience	113.851	2	56.925	24.643	.000	.187
2-way Interactions						
Treatment x Education	6.292	1	6.292	.681	.508	.013
Treatment x Experience	47.505	2	23.753	3.141	.107	.088
Education x Experience	9.377	1	9.377	2.030	.157	.019
3-way Interactions						
Treat. x Educ. x Experience	6.045	2	3.022	.654	.522	.012
Residual	494.333	67	7.378			
Total	1041238.00	78				
Multiple R-Squared						.992
Multiple R						.996

The outcome of Table 4.1 showed that there was a significant main effect of treatment on participants' knowledge about safe driving behaviour ($F_{(1,67)}$=67.34, p<.05, η^2=.56). This means that there was a significant difference in the mean scores of knowledge about safe driving behaviour of participants that were exposed to multimedia-based (MbRSE) road safety education (RSE).This simply showed the contributing effect size of 55.7%. Thus, hypothesis one (a) was not accepted. It was therefore concluded that there was a significant main effect of treatment on participants' knowledge about safe driving behaviour. This showed that the MbRSE was effective for improving knowledge about safe driving behaviour of interstate commercial minibus drivers. To ascertain the direction of the difference and determine the magnitude of the mean scores of the participants' knowledge about safe driving behaviour in each of the treatment groups, Multiple Classification Analysis (MCA) was calculated and given below;

Table 4.2: Multiple Classification Analysis (MCA) showing the Difference in the Knowledge about Safe Driving Behaviour Among the Treatment Groups

Variable + Category Grand Mean = 24.23	N	Unadjusted Variation	Eta	Adjusted for Independent + Covariates Deviation	Beta
Treatment Group:					
1. Experimental Group (Road Safety Education)	41	12.52	.96	12.30	.74
2. Control Group (RTAs Education)	37	-8.38	.96	-8.71	

From Table 4.2, it could be observed that there was a significant difference in the posttest mean scores of knowledge about safe driving behaviour between experimental (MbRSE) and control (RTAE) groups; participants in the road safety education group ($\bar{x}$ $\bar{x}$=35.75) had better knowledge about safe driving behaviour (experimental group) than those in the control group ($\bar{x}\,\bar{x}$=15.85). This implies that the MbRSE had the greater capacity to improve knowledge about safe driving behaviour of interstate commercial minibus drivers.

(b) Attitude to safe driving behaviour

$H0_1$(b): There is no significant main effect of treatment on participants' attitude to safe driving behaviour.

To test this hypothesis, analysis of covariance was employed to analyse the posttest scores of the participants. The summary of the analysis is presented in Table 4.3.

Table 4.3: Summary of Analysis of Covariance of Attitude to Safe Driving Behaviour Scores by Treatment, Educational Attainment and Driving Experience

Source	Sum of Squares	Df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2182.919	8	2182.919	96.871	.000	.854
Intercept	383.813	1	838.813	37.224	.000	.731
Main Effects						
Treatment group	3234.536	1	3234.536	71.769	.000	.632
Formal education	110.970	1	110.970	4.925	.028	.348
Driving Experience	399.746	2	199.873	3.432	.012	.275
2-way Interactions						
Treatment x Education	71.707	1	71.707	.393	.676	.024
Treatment x Experience	43.365	2	21.682	.962	.384	.114
Education x Experience	13.055	1	13.055	.579	.448	.106
3-way Interactions						
Treat. x Educ. x Experience	47.388	2	23.694	1.051	.352	.111
Residual	5746.342	67	85.7662	21.250	.000	
Total	7763.235	78	99.529			
Multiple R-Squared						.602
Multiple R						.776

Results from Table 4.3 showed that there was a significant main effect of treatment on participants' attitude to safe driving behaviour ($F_{(1,67)}$=71.77, $p<0.05$; η^2=63). This means that there was a significant difference in the mean scores of attitude to safe driving behaviour of participants managed with MbRSE (experimental group) when compared with those exposed to the RTAE (control group). A cursory look at the result also showed the contributing size of 63.2%. Thus, hypothesis one (b) was rejected. It was therefore concluded that there was a significant main effect of treatment on participants' attitude to safe driving behaviour. This implies that the RSE was effective for improving attitude to safe driving behaviour of interstate commercial minibus drivers.

To ascertain the direction of the difference and determine the magnitude of the mean scores of the participants' attitude to safe driving behaviour in each of the treatment group, Multiple Classification Analysis (MCA) was calculated and presented in Table 4.4.

Table 4.4: Multiple Classification Analysis (MCA) showing the Difference in the Attitude to Safe Driving Behaviour among the Treatment Groups

Variable + Category Grand Mean = 43.31	N	Unadjusted Variation	Eta	Adjusted for Independent + Covariates Deviation	Beta
Treatment Group:					
1. Experimental Group (Multimedia-based Road Safety Education)	41	13.36		12.97	
				-7.01	.81
	37	-6.38	.89		
2. Control Group (RTAs Education)					

From Table 4.4, it could be observed that there was a significant difference in the posttest scores of attitude to safe driving behaviour between experimental (MbRSE) and control (RTAE) groups; participants in the experimental group ($\bar{x}\,\bar{x}$=56.67) had improved attitude to safe driving behaviour than those in the control group ($\bar{x}\,\bar{x}$=36.93). This implies that MbRSE had greater strength to improve attitude to safe driving behaviour of interstate commercial minibus drivers.

Hypothesis Two ($H0_2$)

$H0_2$: There is no significant main effect of educational attainment on participants'

(a) knowledge about, and

(b) attitude to safe driving behaviour.

(a) Knowledge about safe driving behaviour.

$H0_2$ (a): There is no significant main effect on educational attainment on participants' knowledge about safe driving behaviour.

To test this hypothesis, analysis of covariance was employed to analyse the posttest scores of the participants (based on the educational attainment) on their level of knowledge about safe driving behaviour, using the pretest scores as covariate to ascertain if the post experimental differences are statistically significant. The summary of the analysis is shown in Table 4.1 earlier presented. However, the results from Table 4.1 showed that there was a significant main effect of formal education on the participants' knowledge about safe driving behaviour ($F_{(1,67)}$=2.32, $p<.05$, η^2=.12). This means that

there was a significant difference in the mean score of knowledge about safe driving behaviour of participants based on the level of education (educated and non-educated). Hence, hypothesis two (a) was rejected. It was therefore concluded that there was a significant main effect of educational attainment on participants' knowledge about safe driving behaviour.

To ascertain the direction of the difference and determine the magnitude of the mean scores of the participants' knowledge about safe driving behaviour in each of the treatment group, Multiple Classification Analysis (MCA) was calculated and presented in Table 4.5.

Table 4.5: MCA showing the Difference in the Knowledge about Safe Driving Behaviour among the Treatment Groups

Variable + Category Grand Mean = 24.23	**N**	**Unadjusted Variation**	**Eta**	**Adjusted for Independent + Covariates Deviation**	**Beta**
Formal Education					
1. Educated	33	10.02	.05	9.04	.00
2. Non-educated	45	-5.65		-5.06	

The results in Table 4.5 showed the significant difference in the posttest mean scores of knowledge about safe driving behaviour of educated and non-educated participants. Educated participants had a mean value of 34.25, while non-educated participants had a mean value of 18.50. This simply implies that educated participants benefited from the treatment (mBRSE) than non-educated participants.

(b) Attitude to safe driving behaviour

$H0_2$ (b): There is no significant main effect of educational attainment on participants' attitude to safe driving behaviour.

To test this hypothesis, analysis of covariance was employed to analyse the posttest scores of the participants (based on the educational attainment) on their level of knowledge about safe driving behaviour, using the pretest scores as covariate to ascertain if the post experimental differences are statistically significant. The summary of the analysis is shown in Table 4.3. However, the results from Table 4.3 showed that there was a significant main effect of formula education on participants' attitude to safe driving behaviour ($F_{(1,76)}$=4.93, $p<.05$, η^2=.35). This means that there was significant difference in

the mean scores of attitude to safe driving behaviour of the participants based on the educational attainment (educated and non-educated). Thus, hypothesis two (b) was not accepted. It was therefore concluded that there was a significant main effect of formal education on participants' attitude to safe driving behaviour.

To ascertain the direction of the difference and determine the magnitude of the mean scores of the participants, attitude to safe driving behaviour in each of the treatment group, Multiple Classification Analysis (MCA) was calculated and prescribed in Table 4.6.

Table 4.6: MCA showing the Difference in the Attitude to Safe Driving Behaviour among the Treatment Groups

Variable + Category Grand Mean = 43.31	**N**	**Unadjusted Variation**	**Eta**	**Adjusted for Independent + Covariates Deviation**	**Beta**
Educational Attainment					
1. Educated	33	11.29	.09	10.84	.01
2. Non-educated	45	-4.77		-4.10	

The result in Table 4.6 showed the significant difference in the posttest mean scores of attitude to safe driving behaviour of participants had a mean value of 56.60, while non-educated participants had a mean value of 38.54. This implies that educated participants benefited from the treatment (MbRSE) than their non-educated counterparts.

Hypothesis Three ($H0_3$)

$H0_3$: There is no significant main effect of driving experience on participants'

(a) knowledge about,

(b) attitude to safe driving behaviour.

(a) Knowledge about safe driving behaviour

$H0_3$ (a): There is no significant main effect of driving experience on participants' knowledge about safe driving behaviour.

To test this hypothesis, ANCOVA was employed to analyse the posttest scores of the participants (based on driving experience) on their level of knowledge about safe

driving behaviour, using the pretest scores as covariate to ascertain if the post-experimental differences are statistically significant. The summary of the analysis is shown in Table 4.1. However, the results from Table 4.1 showed that there was a significant main effect of driving experience on participants' knowledge about safe driving behaviour ($F_{(2,67)}$=24.64, p<.05, η^2=.19). This means that there was a significant difference in the mean scores of knowledge about safe driving behaviour of participants based on driving experience (high, moderate and low). Thus, hypothesis three (a) was rejected. Therefore, there was a significant main effect of driving experience on participants' knowledge about safe driving behaviour.

To ascertain the direction of the difference and determine the magnitude of the mean scores of the participants' knowledge about safe driving behaviour in each of the treatment group, Multiple Classification Analysis (MCA) was calculated and presented in Table 4.7.

Table 4.7: MCA showing the Difference in the Knowledge about Safe Driving Behaviour among the Treatment Groups

Variable + Category Grand Mean = 43.31	**N**	**Unadjusted Variation**	**Eta**	**Adjusted for Independent + Covariates Deviation**	**Beta**
Driving Experience					
1. Low	27	-10.86		-12.66	
2. Moderate	23	-2.14		-1.91	
3. High	28	10.78	.44	9.57	.08

The result in Table 4.7 showed the significant difference in the posttest mean scores of knowledge about safe driving behaviour of participants with high, moderate and low driving experience. Participants with high driving experience had a mean score of 35.01. This was followed by participants with moderate driving experience (22.09). Participant with low driving experience had the lowest mean value of 13.37. This implies that participants with high driving experience benefited from the treatment (MbRSE) than those with moderate and low driving experience. Participants with moderate driving experience benefited from the treatment than those with low driving experience.

(b) Attitude to safe driving behaviour

$H0_3$ (b): There is no significant main effect of driving experience on participants' attitude to safe driving behaviour.

To test this hypothesis, ANCOVA was employed to analyse the posttest scores of the participants (based on driving experience) on their level of attitude to safe driving behaviour, using the pretest scores as covariate to ascertain if the post experimental differences are statistically significant. The summary of the analysis is shown in Table 4.3 as earlier presented. However, the results from Table 4.3 showed that there was a significant main effect of driving experience on participants' attitude to safe driving behaviour ($F_{(2,67)}$=3.43, $p<.05$, η^2=.28). This means there was a significant difference in the mean scores of attitude to safe driving behaviour of participants with high, moderate and low driving experience. Hence, hypothesis three (b) was rejected. It was, therefore, concluded that there was a significant main effect of driving experience on participants' attitude to safe driving behaviour.

To ascertain the direction of the difference and determine the magnitude of the mean scores of the participant's attitude to safe driving behaviour in each of the treatment groups, Multiple Classification Analysis (MCA) was calculated and presented in Table 4.8.

Table 4.8: MCA showing the Difference in Attitude to Safe Driving Behaviour among the Treatment Groups

Variable + Category Grand Mean = 43.31	N	Unadjusted Variation	Eta	Adjusted for Independent + Covariates Deviation	Beta
Driving Experience					
1. Low	27	-5.74		-4.93	
2. Moderate	23	2.38		2.91	
3. High	28	12.09	.51	11.89	.08

The result in Table 4.8 showed the significant difference in the posttest mean scores of attitude to safe driving behaviour of participants with high, moderate and low driving experience. Participants with high driving experience had a mean value of 55.40, while participants with moderate driving experience had 45.69. The participants with low driving experience had the lowest mean value of 37.57. This result confirmed that participants with high driving experience benefitted from the treatment (MbRSE) than those with moderate and low driving experience. Participants with moderate driving experience benefited from the treatment than those with low driving experience.

Hypothesis Four ($H0_4$)

$H0_4$: There is no significant interaction effect of treatment and formal education on participants'

(a) knowledge about, and

(b) attitude to safe driving behaviour.

This hypothesis was tested by a 2x2x3 analysis of covariance of the posttest scores using pretest scores as covariates. The results obtained are presented in Tables 4.1 and 4.3.

(a) Knowledge about safe driving behaviour

$H0_4$ (a): There is no significant interaction effect of treatment and formal education on participants' knowledge about safe driving behaviour.

The summary of ANCOVA as presented in Table 4.1 was revisited and the result of the two-way interaction showed that F-ratio ($F_{(2,67)}$=.68, p>.05, η^2=.01) was not significant. Therefore, the null hypothesis suggesting no significant interaction effect of treatment and formal education on participants' knowledge about safe driving behaviour was not rejected.

(b) Attitude towards safe driving behaviour.

Ho_4(b): There is no significant interaction effect of treatment and formal education on participants' attitude to safe driving behaviour.

The data collected with their corresponding analysed results as presented in Table 4.3 were revisited. The result as contained under the two-way interactions showed that there was no significant interaction between treatment and formal education on participants' attitude to safe driving behaviour ($F_{(1,67)}$=.39, p>.05, η^2=.02) was not significant. The null hypothesis was therefore accepted. This implies that there was no significant interaction effect of treatment and formal education on participants' attitude towards safe driving behaviour.

Hypothesis Five ($H0_5$)

$H0_5$: There is no significant interaction effect of treatment and driving experience on participants'

(a) knowledge about, and

(b) attitude to safe driving behaviour.

This hypothesis was tested by a 2x2x3 analysis of covariance of the posttest scores using the pretest scores as covariates. The results obtained are presented in Tables 4.1 and 4.3.

(a) Knowledge about safe driving behaviour

$H0_5$ (a): There is no significant interaction effect of treatment and driving experience on participants' knowledge about safe driving behaviour.

The summary of ANCOVA as shown in Table 4.1 was revisited and the result of the two-way interaction revealed that F-ratio ($F_{(2,67)}$=3.14, p>.05, η^2=.09) was not

significant. Therefore, the null hypothesis suggesting no significant interaction effect of educational attainment and driving experience on participants' knowledge about safe driving behaviour was accepted.

(b) Attitude to safe driving behaviour

$H0_5$ (b): There is no significant interaction effect of treatment and driving experience on participants' attitude to safe driving behaviour.

The data collected with their corresponding analysed result as presented in Table 4.3 were revisited. The result as shown under the two-way interactions showed that there was no significant interaction between educational attainment and driving experience on participants' attitude to safe driving behaviour. ($F_{(2,67)}$=.96, p>.05, η^2=.11). The null hypothesis was therefore not rejected. This implies that there was no significant interaction effect of treatment and driving experience on participants' attitude to safe driving behaviours.

Hypothesis Six ($H0_6$)

$H0_6$: There is no significant interaction effect of educational attainment and driving experience on participants'

(a) knowledge about, and

(b) attitude to safe driving behaviour.

This hypothesis was tested by a 2x2x3 analysis of covariance of the posttest scores using the pretest scores as covariates. The results obtained are presented in Tables 4.1 and 4.3.

(a) Knowledge about safe driving behaviour.

$H0_6$ (a): There is no significant interaction effect of educational attainment and driving experience on participants' knowledge about safe driving behaviour.

The summary of ANCOVA as presented in Table 4.1 was revisited and the result of the two-way interaction revealed that F-ratio ($F_{(1,67)}$=2.03, p>.05, η^2=.02) was not significant. Therefore, the null hypothesis suggesting no significant interaction effect of educational attainment and driving experience on participants' knowledge about safe driving behaviour was accepted.

(b) Attitude to safe driving behaviour

$H0_6$ (b): There is no significant interaction effect of educational attainment and driving experience on participants' attitude to safe driving behaviour.

The data collected with their corresponding analysed result as presented in Table 4.3 were revisited. The result as contained under the two-way interactions showed that there was no significant interaction between educational attainment and driving experience on participants' attitude towards safe driving behaviour ($F_{(1,76)}$=.58, p>.05, η^2=.11) was not significant. The null hypothesis was therefore accepted. This means that there was no significant interaction effect of educational attainment and driving experience on participants' attitude to safe driving behaviour.

Hypothesis Seven ($H0_7$)

$H0_7$: There is no significant interaction effect of treatment, educational attainment and driving experience on participants'

(a) knowledge about,

(b) attitude to safe driving behaviour.

The data collected were analysed as presented in Tables 4.1 and 4.3.

(a) Knowledge about safe driving behaviour

$H0_7$ (a): There is no significant interaction effect of treatment, educational attainment, and driving experience on participants' knowledge about safe driving behaviour.

As shown in Table 4.1, the result of 3-way interaction revealed that no significant interaction exist among the treatment, educational attainment and driving experience on participants' knowledge about safe driving behaviour ($F_{(2,67)}$=.65, p>.05, η^2=.01). Therefore, the null hypothesis was accepted.

(b) Attitude to safe driving behaviour.

$H0_7$ (b): There is no significant interaction effect of treatment, educational attainment and driving experience on participants' attitude to safe driving behaviour.

The summary of ANCOVA as presented in Table 4.3 was revisited and three-way interactions result showed that no significant interaction existed among the treatment,

educational attainment and driving experience on participants' attitude to safe driving behaviour ($F_{(2,76)}$=1.05, p>.05, η^2=.11). The null hypothesis was, therefore, not rejected.

4.3 Discussion of results

In this section, the impact of the multimedia-based road safety education, educational attainment and driving experience on participants' knowledge and attitude to safe driving behaviour were discussed. The discussion on the impacts was made in line with the hypotheses tested.

4.3.1 Effect of treatment on knowledge about safe driving behaviour

Hypothesis 1(a) sought to examine if there is any significant main effect of treatment on participants' knowledge about safe driving behaviour. The result of the study revealed significant difference between the experimental and the control groups ($F_{(1,67)}$=67.34, p<.05, η^2=0.56) as shown on Table 4.1. This result does not give support for hypothesis 1(a), suggesting a non-significant main effect hence, the rejection. However, the data collected appear to provide evidence in favour of the experimental group as being superior over its control counterparts on the knowledge about safe driving behaviour. Since the experimental group was exposed to the road safety education, then the education was found to have contributed significantly to the improvement on the knowledge about safe driving behaviour among the participants.

This result is in agreement with the findings of Johnson and Adebayo (2011), and Onuka and Akinyemi (2012). These authors found multimedia-based safety education to have contributed significantly to the improvement on the knowledge of and compliance with road safety signs among commercial motorcyclists. The result of this study also conform with findings of Okafor, et al (2014), Stalvey and Owsley (2003), Ker, Roberts, Colher, Beyer, Bun and Frost (2005) and Van Ranst, Silverstein and Gottlieb (2005). These authors found that road safety education is effective in improving poor knowledge among commercial minibus drivers. However, the possible explanation for the improvement on the knowledge about safe driving behaviour among the participants could also be associated with the establishment of effective interpersonal relationship characterised by mutual trust and respects between the researcher and the participants. Furthermore, the treatment requires the participants to engage in activities designed to increase the retention of knowledge and transfer of the driving skills.

4.3.2 Effect of treatment on attitude to safe driving behaviour

Hypothesis 1(b) sought to investigate if there is any significant main effect of treatment on participants' attitude to safe driving behaviour. The result of the present study showed a significant difference between the experimental and the control group ($F(2,67)=71.77$, $p<0.05$, $\eta^2=0.63$) as presented in Table 4.3. This result does not provide support for hypothesis 1(b), stating a non-significant main effect. Thus, the hypothesis was rejected. However, the data collected appear to provide evidence in favour of the experimental group as being superior over the control group and the attitude to safe driving behaviour. The fact that the experimental group was managed with the (MbRSE) road safety education than the safety education made it contributed significantly to the improvement on attitude to safe driving behaviour among the participants.

This result is in consonance with those of Bedard, Porter, Marshall, Isherwood, Remdeance, Weaver, and Miller-Polgar (2008), Adogue and IIika (2006), Oginni, Ugboko and Adewole (2007) and Owsley, Stalvey and Phillips (2003). These researchers found that road safety education is a powerful tool for promoting self-regulation among high-risk commercial minibus drivers and motorcyclists. Noticeably, the effectiveness of the treatment protocol could be attributed to its attentional advice on what is most important to attend to whole driving and explanations of why the safety driving skills are useful or necessary. More importantly, the application of high technological devices in the demonstration helps the participants to identify and attend to the targeted behaviour (unsafe driving behaviour). However, the poor knowledge about and negative attitude towards safe driving behaviour among participants in the control group may be due to the fact that they have not acquired more effective strategies that can be employed to improve on their knowledge about and attitude towards safe driving behaviour.

4.3.3 Effect of formal educational attainment on knowledge about safe driving behaviour

Hypothesis 2(a) sought to determine if there is any significant main effect of formal education on participants' knowledge about safe driving behaviour. The result of the study also revealed a significant difference among educated and non-educated participants in the knowledge about safe driving behaviour. ($F_{(1,67)}=2.32$, $p<.05$, $\eta^2=0.12$) as indicated on Table 4.1. The result does not provide support for hypothesis 2(a), stating a non-significant effect. Thus, the hypothesis was rejected. Further data analysis showed

that educated participants benefited from the treatment more than non-educated counterparts.

These findings are consistent with the findings of Kormer-Bitensky, Kua, Von Zweck and Van Benthem (2009). These authors observed strong evidence that education combined with on-road training improves driving performance and moderate evidence that it improves knowledge. The fact is that the educated participants have previously acquired more complex knowledge and skills that are applicable over a wider variety of contexts than those presented in the treatment protocol. As a result of this, the information and activities included in the safety education were deeply processed, thereby improving their knowledge about safe driving behaviour than non-educated participants.

4.3.4 Effect of educational attainment on attitude to safe driving behaviour

Hypothesis 2(b) sought to examine if there is any significant main effect of formal education on participants' attitude to safe driving behaviour. The result of the study revealed a significant difference between educated and non-educated participants in the attitude towards safe driving behaviour ($F_{(1,76)}$=4.93, $p<0.05$, η^2=0.35) as presented in Table 4.3. The result does not provide support for hypothesis 2(b), stating a non-significant effect. Hence, the hypothesis was not accepted. Further data analysis showed that the educated participants benefited from the safety education than the non-educated participants. These findings go further to give empirical support to the previous findings (Begg and Langley (2000), Preusser, Williams and Lund, (1991); Murray, (1996), Shinar, et al., (2001). However, the possible explanation for this finding may be that the educated participants were more than non-educated participants, and were more likely to recognise the key behaviours in the treatment protocols when the consequences of the behaviour were shown. This increases the attentional processes of the educated participants by making the critical behaviours more salient.

4.3.5 Effect of driving experience on knowledge about safe driving behaviour

Hypothesis 3(a) sought to examine if there is any significant main effect of driving experience on participants' knowledge about safe driving behaviour. The result of the present study revealed a significant difference among participants with high moderate and low driving experience in the knowledge about safe driving behaviour ($F_{(2,67)}$=24.64, $p<0.05$, η^2=0.19) as indicated in Table 4.1. The result does not provide support for hypothesis 3(a), stating a non-significant effect. Thus, the hypothesis was rejected.

Further data analysis revealed that participants with high driving experience showed greatest improvement on the knowledge than participants with moderate and low driving experience. However, this result is in agreement with the result of Mayhew and Simpson (1990), National Highway Safety Administration (NHTSA, 1991), Svenson (1981), Groeger (2006), Mayhew, Simpson and Pak (2003). The explanation of this outcome is that the critical driving skills possessed by the participants with more driving experience were well nurtured by the treatment protocol.

4.3.6 Effect of driving experience on attitude to safe driving behaviour

Hypothesis 3(b) sought to determine if there is any significant main effect of driving experience on participants' attitude to safe driving behaviours. The result of this study showed a significant difference in attitude towards safe driving behaviour among participants with high, moderate and low experience ($F_{(2,67)}=3.43$, $p<0.05$, $\eta^2=0.28$) as presented in Table 4.3. The finding does not provide support for hypothesis 3(b), indicating a non-significant effect. Hence, the hypothesis was not accepted. Further, data analysis revealed that participants with high driving experience revealed greatest improvement in the attitude towards safe driving behaviour than those with moderate and low driving experience. However, these findings corroborate the findings of NHTSA (1993), Rothangatter (2000), Svenson (1981), Bamberg, Ajzen and Schmidt (2003), Norman (2002) and Quine, Rutter and Arnold (2001). It could be argued that the road safety education is capable of enhancing commercial mini-bus drivers' standards hereby promoting the safer operation of mini-bus. Thus, the need for education and desire for change in the attitude were better accepted and understood by the participants with high driving experience than their counterparts with moderate and low driving experience.

4.3.7 Interaction effect of treatment and educational attainment on knowledge about safe driving behaviour

The result obtained in Table 4.1 to test hypothesis 4(a) was found to be non-significant with the F-value ($F_{(2,67)}=0.68$, $p>0.05$, $\eta^2=0.01$). That is the data collected appeared to support the stated null hypothesis that there was no significant interaction effect of treatment and educational attainment on participants' knowledge about safe driving behaviour. These findings support that the effect of the treatment did not differ with the level of formal education. In other words, the safety education made a difference for both educated and non-educated participants. And since the safety education had been

established as being effective for enhancing interstate commercial minibus drivers' knowledge about safe driving behaviour, then, irrespective of their status: educated or non-educated, the safety education was found to be appropriate. Thus, both the educated and the non-educated benefited from the treatment. The finding of this study is consistent with that of Korner-Bitensky et al (2009).

4.3.8 Interaction effect of treatment and educational attainment on attitude to safe driving behaviour

The result obtained in Table 4.3 to test hypothesis 4(b) was found to be non-significant with the F-value ($F_{(1,67)}$=0.39, p>0.05, η^2=0.02). That is the data collected appeared to support the stated null hypothesis that there was no significant interaction effect of treatment and formal education on participants' attitude to safe driving behaviour. These findings support the fact that the effect of road safety education is not different from their educational attainment level. In other words, the treatment made a difference for both the educated and non-educated participants. And since the treatment protocol had been established as being effective for improving interstate commercial minibus drivers' attitude to safe driving behaviour, then, irrespective of their status: educated or non-educated, the safety education was found to be appropriate. Thus, both the educated and the non-educated benefited from the treatment.

4.3.9 Interaction effect of treatment and driving experience on knowledge about safe driving experience

Hypothesis 5(a) sought to find out if there is a significant interaction effect of treatment and driving experience on participants' knowledge about safe driving behaviour. Table 4.1 revealed that there was no significant interaction effect of treatment and driving experience on participants' knowledge about safe driving behaviour with the obtained F-value ($F_{(2,67)}$=3.14, p>0.05, η^2=0.09). That is, the data collected did not provide enough evidence to justify a significant interaction. These findings provided evidence to support that effect of the treatment is not different or does not depend on their level of driving experience. That is, the treatment made a difference for the participants at the three levels of driving experience. And since the safety education was already identified for improving knowledge about safe driving behaviour, then it holds that the treatment is found applicable and appropriate for interstate commercial minibus drivers regardless of their driving experience level.

4.3.10 Interaction effect of treatment and driving experience on attitude about safe driving behaviour

Hypothesis 5(b) sought to find out if there is a significant interaction effect of treatment and driving experience on participants' knowledge about safe driving behaviour. Table 4.1 revealed that there was no significant interaction effect of treatment and driving experience on participants' attitude to safe driving behaviour with the obtained F-value ($F_{(2,67)}$=0.96, p>0.05, η^2=0.11). This means that the data collected did not provide enough evidence to justify a significant interaction. These findings provided evidence to support the fact that the effect of the treatment is not different or does not depend on their level of driving experience. That is, the treatment made a difference for the participants at the three levels of driving experience. And since the road safety education was already identified for improving attitude to safe driving behaviour, then it holds that the treatment is found applicable and appropriate for interstate commercial minibus drivers regardless of their driving experience level.

4.3.11 Interaction effect of educational attainment and driving experience on knowledge about safe driving behaviour

The result obtained in Table 4.1 to test hypothesis 6(a) was found to be non-significant with F-value ($F_{(1,67)}$=2.03, p>0.05, η^2=0.02). In other words, the data provide evidence to support the stated null hypothesis that there is no significant interaction effect of formal education and driving experience on participants' knowledge about safe driving behaviour. The above finding revealed that the impact of the two factors (educational attainment and driving experience) are not dependent on one another. Therefore, the effect of educational attainment is separate and that of driving experience is also separate and one factor cannot hold the other factor to ransom. The result also suggests that whether educated or non-educated and whether high, moderate or low driving experience, the impact of the treatment holds equally or both group with benefit from the treatment.

4.3.12 Interaction effect of educational attainment and driving experience on attitude to safe driving behaviour

The result obtained in Table 4.3 to test hypothesis 6(b) was found to be non-significant with F-value ($F_{(1,76)}$=0.58, p>0.05, η^2=0.11). That is, the data provide evidence to support the stated null hypothesis that there is no significant interaction effect of educational attainment and driving experience on participants' attitude towards safe

driving behaviour. The above findings showed that the impact of the two factors – formal education and driving experience, are not dependent on one another. Therefore, the effect of formal education is separate and that of driving experience is also separate and one factor cannot hold the other factor to ransom. The result also suggests that whether educated or non-educated and whether high, moderate or low driving experience, the impact of the treatment holds equally or both group will benefit from the treatment.

4.3.13 Interaction effect of treatment, educational attainment and driving experience on knowledge about and attitude to safe driving behaviour

The findings of this study support hypothesis seven (a) and (b) that there is no significant interaction effect of treatment, formal education and driving experience on participants' knowledge about ($F_{(2,67)}$=0.65, p>0.05, η^2=0.01) in Table 4.1 and attitude ($F_{(2,76)}$=1.05, p>0.05, η^2=0.11) to safe driving behaviour in Table 4.3. These results suggest that the impact of treatment did not depend on the two factors (formal education and driving experience). This is because the treatment was found to make difference for both educated and non-educated participants, participants with high, moderate and low driving experience.

This study immensely contributes to research in road safety education that investigates interactions among safety education, knowledge and attitude to safe driving behaviour. Such 3-way interaction level is supposed to establish the dependency of the various factors on one another. It is also interesting to observe these findings hold for the road safety education. However, since the multimedia-based road safety education was noted (earlier on) to have had a relatively high significant effect on participants' knowledge about and attitude to safe driving behaviour. then one can assert that such safety education should be recommended as an instructional package that is capable of improving interstate commercial minibus drivers' knowledge about and attitude towards safe driving behaviour.

CHAPTER FIVE
SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Summary

In recent times, RTA has been a leading cause of death and disability among inter-state commercial mini-bus drivers in Nigeria. This may be associated with poor knowledge about and attitude to safe driving behaviour of these drivers. These drivers engage in RDBs that are characterised by driving under the influence of drugs and or alcohol, travelling too fast, distracted driving (use of cell phone, communicating with passengers, listening to loud music), fatigue and ignoring all the traffic rules and regulations. However, those involved in traffic accidents suffer death and severe disability, thereby exposing their families to enormous economic hardship. Previous studies focused more on publicity campaign, effects, causes and prevention of RTA, particularly those relating to the FRSC with little emphasis on safety education interventions. This study, therefore, determined the effect of multimedia-based road safety education on knowledge and attitude to safe driving behaviour among inter-state commercial minibus drivers in Ibadan metropolis, Nigeria.It also examined the moderating effects of educational attainment and driving experience.

The study adopted the pretest-posttest control group, quasi-experimental design with 2x2x3 factorial matrix while Bandura's Social Cognitive theory provided the framework. Two motor parks: Iwo-Road and Ojoo, which have high members of inter-state commercial minibus drivers, were purposively selected in Ibadan metropolis;. Purposive sampling technique was adapted in selecting 45 drivers in each of the two selected motor parks, making a total of 90. Risky Driving Behaviour Rating Scale with scores of 18 and above was the screening tool used to determine drivers with RDBs. The motor parks were randomly assigned to experimental (41 participants) and control (37 participants) groups. Knowledge about safe Driving Behaviour Test and Attitude towards Safe Driving Behaviour Rating Scale were used for data collection. Data were analysed using Analysis of Covariance and Multiple Classification Analysis at 0.05 level of significance. The results revealed the following:

(i) There was a significant main effect of treatment on the participants' knowledge about and the attitude towards safe driving behaviour; the participants in the experimental condition significantly improved on their knowledge about and the attitude to safe driving behaviour better than those in the control group.

(ii) There was a significant main effect of educational attainment on the participants' knowledge about and attitude to safe driving behaviour. More specifically, the educated participants benefited from the treatment better than the non-educated participants.

(iii) There was a significant main effect of driving experience on the participants' knowledge about and the attitude to safe driving behaviour. Specifically, the participants with high driving experience benefited from the treatment better than those with moderate and low driving experience. Moreover, the participants with moderate driving experience benefited from the treatment better than those with low driving experience.

(iv) There was no significant interaction effect of treatment and educational attainment on participants' knowledge of and attitude to safe driving behaviour.

(v) There was no significant interaction effect of treatment and driving experience on the participants' knowledge about and attitude to safe driving behaviour.

(vi) There was no significant interaction effect of educational attainment and driving experience on the participants' knowledge about and attitude to safe driving behaviour.

(vii) There was no significant interaction effect of treatment, educational attainment and driving experience on the participants' knowledge about and traffic to safe driving behaviour.

5.2 Conclusion

From the result of this study, it is evident that Multimedia-based road safety education is effective for the enhancement of knowledge about and attitude towards safe driving behaviour among inter-state commercial minibus drivers. And since the three-way interaction effect of treatment, educational attainment and driving experience was not significant, then it suggests the suitability of the Multimedia-based road safety education for inter-state commercial minibus drivers regardless of their educational and level of driving experience. The findings lend support to the previous empirical research that is grounded in the principle of behaviour change.

5.3 Recommendations

Based on the findings of the study, the following recommendations are hereby advanced.

1. Interstate commercial minibus drivers with RDBs should be helped by the FRSC, federal and state VIOs, NURTW, RTEAN and other private and public organisations involved in transport development services.
2. The Federal Road Safety Commission, Federal and State VIOs, NURTW, RTEAN and other private and public organisations involved in transport development services need and deserve to be informed of the potency of the multimedia-based road safety education on improving the knowledge about and attitude towards safe driving behaviour of inter-state commercial minibus drivers.
3. The Federal Road Safety Commission, Federal and State VIOs, NURTW, RTEAN and other public and private organisations involved in transport development services could use the multimedia-based road safety education to enhance the knowledge about and attitude towards safe driving behaviours of inter-state commercial minibus drivers.
4. The treatment strategy is recommended for inter-state commercial minibus drivers regardless of their level of educational attainment (educated and non-educated) and driving experience (high, moderate, low), since the three-way interaction effect of treatment, educational attainment and driving experience was insignificant.
5. The Federal Road Safety Commission, Federal and State VIOs, NURTW, RTEAN and other public and private organisations involved in transport development services should develop more interest in using these treatment strategies to enhance the knowledge about and attitude towards safe driving behaviours of inter-state commercial minibus drivers who have no education and with low driving experience.

5.4 Contributions to knowledge

The study is unique in its contribution to knowledge on how knowledge of and attitude to safe driving behaviour among inter-state commercial minibus drivers can be enhanced. Literature indicated that very few studies have addressed the impact of multimedia-based road safety education on knowledge and attitude to safe driving behaviour among interstate commercial minibus drivers and most of them were mainly

carried our in developed countries. This study, therefore serves as a basis for further research into the area of locally applicable interventions for the enhancement of knowledge about and attitude to safe driving behaviour among interstate commercial minibus drivers.

Furthermore, the study showed that the treatment package had a significant effect on the improvement of knowledge of and attitude towards safe driving behaviours among inter-state commercial minibus drivers. The discovery explained how the Multimedia-based road safety education employed several different treatment components that addressed unsafe driving behaviour among interstate commercial minibus drivers. Also, since the three way interaction effect of treatment, educational attainment and driving experience was not significant, then it suggests the suitability of the treatment package regardless of educational attainment (educated and non-educated) and driving experience (high, moderate and low).

The development of Multimedia-based road safety education to advance the driving behaviour of commercial mini-bus drivers.

Development of risky driving behaviour rating scale instrument.

5.5 Limitation of the study

There were limitations which may affect the generalisation of the study. These include the following:

- The researcher investigated the impact of multimedia-based road safety education on knowledge of and attitude to safe driving behaviour among interstate commercial minibus drivers in Ibadan metropolis. This treatment package is not exclusive and therefore, basing the findings strictly on it may tend to affect the generalisation of the result. The study only focused on one metropolis in a state: Ibadan, Oyo State and drew sample from two motor parks. These factors may limit the extent of inference drawn for the purpose of generalisation in Nigeria.
- The study was constrained by the social nature of the drivers. The decision to participate in the study was a difficult choice faced by the commercial drivers because of the fear of being stigmatised by friends and transport unions or arrested by the appropriate law enforcement agents for their self-reported unsafe driving behaviour. This experience affected the number of participants used in this study which in turn may limit the generalisation of the result.

- The study was further constrained by financial resources available to the researcher. The financial implication of maintaining the inter-state commercial minibus drivers was enormous. Although, this has never affected the result of the study.

5.6 Implications of the study

The effectiveness of the Multimedia-based road safety education on knowledge about and attitude towards safe driving behaviour among inter-state commercial minibus drivers had been clearly demonstrated by this study. The participants in the treatment condition significantly improved on their knowledge about and attitude towards safe driving behaviours. Also, poor knowledge about and attitude towards safe driving behaviours had further demonstrated the weakness of education on RCs as a means for improving the driver's knowledge of and attitude towards safe driving behaviours. Hence, the Federal Road Inspection Officers (VIOs), NURTW, RTEAN, and other private and public organisations involved in road transport development services could use the technique to improve on knowledge of and attitude towards safe driving behaviours among inter-state commercial minibus drivers.

Nonetheless, the insignificant interaction effect of educational attainment and driving experience on participants' knowledge of and attitude towards safe driving behaviours is worthy of mention. By implication, FRSC, VIOs, NURTW, RTEAN and other private and public organisations involved in transport development services should not entertain any doubt about potency of the road safety education in enhancing knowledge of and attitude towards safe driving behaviours, since the treatment package was found suitable for the drivers regardless of their educational attainment (educated or non-educated) and driving experience (high, moderate, low).

5.7 Suggestion for further studies

1. The study should be replicated in order to confirm the merit or otherwise of the treatment package.
2. A longitudinal study of the effect of treatment package on the categories of commercial drivers should be carried out.
3. The interaction effect of other factors such as age, ownership of the vehicle, religion and marital status should be investigated in future studies.

4. The number of participants and motor parks should be increased in the future studies to determine the adequacy of generalisation of findings.
5. The study should be replicated to determine the general applicability of the treatment package for various ethnic populations.

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APPENDIX I

DEPARTMENT OF ADULT EDUCATION
UNIVERSITY OF IBADAN, IBADAN
RESEARCH QUESTIONNAIRE

Dear Respondent,

This questionnaire is mainly for academic purpose. There is therefore no right or wrong answer, so complete this questionnaire with all honesty and sincerity.The information you give will be for the purpose of research.Thank you for your cooperation.

FORM A: Demographic Information

INSTRUCTION: Please fill the following spaces provided.

Participants Code Number…….

Motor Park Code Number……..

Route ……..

Age Bracket: 18-25 ( ) 26-33 ( ) 34-41 ( ) 41-49 ( ) 50-Above ( )

Marital status: married ( ) single ( ) separated ( )

Religion: Christianity ( ) Islam ( ) others ( )

Nationality……..

State of Origin…….

Educational Qualifications;

None [ ] Primary school [ ] Secondary school [ ] Tertiary education [ ]

Do you have a valid drivers' license? Yes [] No [ ]

If yes, when was it obtained?

When will it expire?

How long have you been driving? 1-8years ( ) 9-16 years ( ) 17-24 years ( ) 25-32 years ( ) 33 years and above

Did you go to a driving school? Yes ( ) No ( )

If no, how did you acquire driving skills?

Observation and practice ( ) Assisted by friends and relations ( )

Who owns the vehicle?

Driver ( )

Other transport union member/executive ( )

Public transport company/Scheme ( )

APPENDIX II

DEPARTMENT OF ADULT EDUCATION
UNIVERSITY OF IBADAN, IBADAN
RESEARCH QUESTIONNAIRE

Dear Respondent,

This questionnaire is mainly for academic purpose. There is therefore no right or wrong answer, so complete this questionnaire with all honesty and sincerity. The information you give will be for the purpose of research.Thank you for your cooperation.

Form B: Knowledge about Safe Driving Behaviour Test (KSDBT)

INSTRUCTION; Please choose by circling the most appropriate response from the options provided

1. All of the following activities are essential before a vehicle driver takes off except ONE

   A. Ensure that the inner mirror is functional
   B. Ensure that the waste basket is adequately placed
   C. Observe the mirror and ensure that the road is clear

2. Which of the following statements does not describe good driving culture?

   A. Put the gear in a neutral position, then take off.
   B. Always fasten your seatbelt and take off smoothly.
   C. Check to ensure that conductor is not left behind.

3. Under safety precautions, ONE of the following is NOT important;

   A. Ensure that all the mirrors are functional
   B. Ensuring that the gear oil is in the gear engine
   C. Ensuring that the passengers are full in the vehicle

4. Which of the following is most appropriate when applying brake?

   A. Fairly get too close to the vehicle in front
   B. Slow down; brake smoothly and in a controlled manner
   C. Apply the brake only when you are about two meters to the vehicle in front

5. Which of the following should be considered before applying brake?
   A. Be mindful of the vehicle behind
   B. Be mindful of the vehicle in front
   C. Be mindful of the passengers in the vehicle

6 All of the following statements describe a good braking habit except ONE
   A. Never allow the brake pedals to be too old
   B. Never get too close to the vehicle in front
   C. Never mind to apply the brake when you are on motion

7. Which of the following statements is correct about good reversing habits?

A. Ensure that there are no pedestrians on the road behind you.
B. Do not bother about the people passing behind your vehicle
C. Ensure that the gear is in a neutral position.

8 Which of the following is NOT safe for reversing a vehicle?
A. On the road with high traffic volume
B. On the road with light traffic volume
C. On the straight and clear road

9 The following conditions are very essential while driving EXCEPT
A. Ensuring that the driver concentrates fully.
B. Ensuring that you don't sleep or dose off
C. Ensuring that the driver has taken a bottle of schnapps or dry gin

10 What is the speed limit for taxis and buses on the highway?
A. 60km/hr
B. 90km/hr
C. 80km/hr

11 What is the speed limit for taxis and buses on the expressway?
A. 90 km/hr
B. 70 km/hr
C. 100km/hr

12. What is the speed limit for taxis and buses in town and cities?
A. 50km/hr
B. 55km/hr
C, 60km/hr

13. Which of the following traffic light instruct the driver to stop or not to pass through?
A. Red
B. Amber
C. Green

14. Two solid lines on the highway means
A. No road for all users
B. No road for big trucks only
C. No cross or overtaking

15. When there is a big line on letter P, like  That means;

A. You can park your vehicle there
B. You cannot park your vehicle there
C. You can leave your vehicle for some hours there

16. Which of the following should be considered important before entering the expressway?

A. Ensure that the vehicle is fit enough to cruise at a safe speed

B. Do not bother about the vehicle on the left lane
C. Do not bother about the vehicle on the right lane

17. When there is a big line on a curved arrow sign facing down, like  That means;
A You can make a U-Turn
B You cannot make U-Turn
C There is a police station nearer you

18 When driving in a school environment, what should you do?
A Increase your speed
B Stop your vehicle
C Slow down your speed

19. Which of the following actions encourages safe overtaking?
A. Overtake on the left line when the traffic volume is high
B. Overtake on the right line when there is no traffic
C. Overtake on the left line when there is no traffic

20. Which of the following is correct when overtaking?
A. Do not bother about the vehicles in front of you
B. Increase your speed and move too close
C. Ensure that there are no vehicles coming in front, then accelerate

21. Which of the following statements describes expressway driving?
A. Speeding beyond the expected speed limit
B. Discussing with passengers while on motion
C. Maintaining your lane and cruise gently as the case may be

22. Which of the following best protects the driver inside the vehicle?
A. Side mirror
B. Seatbelt
C. Inner mirror

23. Which of the following reduces the severity of road crash injury?
A. Head rest
B. Dash Board
C. Safety belt

24. Which of the following enhances good body posture and comfort?
A. Driver's seat
B. Seatbelt
C. Side mirrors

25. Which of the following reduces driver's coordination and slows down reaction?

A. Mirror and windscreen
B. Drug and alcohol
C. Seatbelt and dash board

26. Which of the following is the maximum below alcohol level for drivers
A. 0.05% of Blood Alcohol Concentration
B. 0.50% of Blood Alcohol Concentration
C. 0.005% of Blood Alcohol Concentration

27. Which of the following affects Driver's vision and Judgment?
A. Sickness
B. Vehicle engine
C. Drug and alcohol

28. The following measures are recommended for night time driving EXCEPT
A. Lower the beam of headlamps for vehicle in front of you
B. Avoid looking directly into the light of on – coming vehicles
C. Increase speed slightly when facing glare from oncoming headlights

29. The following activities encourage safety driving in fog or smoke EXCEPT
A. Turning on the low beam headlamps
B. Maintaining low speed
C. Be very careful with vehicles in front and behind you

30. Which of the following should be encouraged during convoy driving
A. Obeying the approximate speed limit and keeping safe distance
B. Run at a faster speed
C. See it as vehicle contest

31. The following are qualities of a determined driver EXCEPT
A. The adequate understanding of Highway code
B. Makes allowance for personal deficiencies
C. Anticipate the action of the passengers

32. The following activities are sources of obstructed driving habits EXCEPT
A. Talking on phone
B. Watching roadside diversion
C. Avoiding distractions from external factors

33. Defensive driving is associated with the following EXCEPT
A. Utilizing safe driving skills to identify, predict and avoid potential hazards while driving
B. Maintaining speed in accordance with the performance of vehicle engine
C. Utilizing safe driving skills to Identify any fault developed by vehicle while driving

34. The following are the aims of First Aids Treatment for road Care victims EXCEPT
A. To preserve the victim from the present condition
B. To prevent the condition from victims

C. To reduce the cost of medical treatment

35. The following actions are expected of a driver not involved in a crash EXCEPT
   A. Display caution sign to protect the scene of the crash from danger
   B. Call 122 or 112 or any officer emergency number for immediate help
   C. Crowd the scene to rescue the victims

APPENDIX III

DEPARTMENT OF ADULT EDUCATION
UNIVERSITY OF IBADAN, IBADAN
RESEARCH QUESTIONNAIRE

Dear Respondent,

This questionnaire is mainly for academic purpose. There is therefore no right or wrong answer, so complete this questionnaire with all honesty and sincerity. The information you give will be for the purpose of research.Thank you for your cooperation.

Form C: Attitude towards safe driving behaviour rating scale (ATSDBRS)

INSTRUCTION; Please read and think about the statements below carefully and tick the ones that apply to you.

Strongly Agree-SA

Agree -A **Disagree -D** **Strongly**

Disagree -SD

S/N	Items	**SA**	**A**	**D**	**SD**
1	I like driving too fast because it saves fuel consumption.				
2	I sometimes like to get very close to the vehicle in front to prevent other vehicle from overtaking.				
3	I sometimes like to speed to meet up with the long journey.				
4	I use seat belt when I feel like using it.				
5	I like to listen to music while driving in long distance because it makes me feel more comfortable and exciting.				
6	I like to smoke cigarette while driving.				
7	I like to ensure that the side or inner mirror of the vehicle is functional before embarking on driving.				
8	I like to assist persons involved in road traffic accident if I see that it will not cause delay for me.				
9	I like to inspect my vehicle parts carefully when I suspect any malfunctions on the road.				

10	I like to take kola or chewing sticks/gum to reduce sleepy feeling while driving.				
11	I like to make a U-turn on the highways if I have the opportunity				
12	I like taking alcohol while driving because it increases my ability to attend to driving tasks.				
13	I like making or receiving phone calls while driving.				
14	I like to see what goes on beside the road while driving.				
15	I like to other drivers to see that I can drive very well on the road.				
16	I like to take shots or alcohol when driving a long distance.				
17	I like to talk or chat with passengers whenever I feel sleepy while driving.				
18	I like to accelerate against the rear of the vehicle in front when I over-take.				
19	I like to reduce my driving speed when I see road safety officials.				
20	I like to learn more about the highway code.				

APPENDIX IV

DEPARTMENT OFADULT EDUCATION
UNIVERSITY OF IBADAN, IBADAN
RESEARCH QUESTIONNAIRE

Dear Respondent,

This questionnaire is mainly for academic purpose. There is therefore no right or wrong answer, so complete this questionnaire with all honesty and sincerity. The information you give will be for the purpose of research.Thank you for your cooperation.

Form D: Risky driving behaviours rating scale (RDBRS)

Instruction: please place a mark (√) in the column that correctly explains your opinion and or feeling

S/N	ITEMS	ALWAYS	SELDOM	NEVER
1	I sometimes drink before I start driving			
2	I sometimes smoke cigarette while driving			
3	I make and receive calls while driving			
4	I sometimes enjoy driving a vehicle with electronic devices such as radio and television.			
5	I derive joy in night driving as long as I can get something drinking			
6	I like to take at least a roll of hard substance before I start driving especially long distance			
7	I talk with my passengers while driving on a long journey			
8	I look and observe diversions, objects and pedestrians while driving			
9	I sometimes overtake in a corner or sharp bend because iam in a hurry			
10	I sometimes feel most traffic rules are difficult to obey while driving			

APPENDIX V

DEPARTMENT OF ADULT EDUCATION
UNIVERSITY OF IBADAN, IBADAN
RESEARCH QUESTIONNAIRE

Dear Respondent,

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Form E: Driving Experience Test (DET)

Instruction: Circle the word which best describes your Judgment of performance on each of the following behaviour.

Information: Please choose the most approximate response from the options provided

1. What do you do before taking off?
    A. I ensure that the vehicle particulars are kept well in the safe
    B. I fasten my seatbelt and take off smoothly
    C. I fasten my seatbelt, observe the mirror, ensure that road is clear and take off smoothly.
2. What would you do if you cannot see clearly behind while reversing your vehicle?
    A. I must switch on the high headlamp and reverse slowly
    B. I must get someone to guide me.
    C. I must switch on my reverse light and move gradually
3. How would you handle brake failure on the motion?
    A. I must pump the brake pedal to increase the pressure in the brake caliber/mechanism
    B. I must apply handbrake immediately
    C. I must switch off the engine and increase the gear position gradually
4. How would you drive under smoke or fog?
    A. I must pull off the road immediately
    B. I must slow down and turn on my low headlamps
    C. I must slow down and turn on my high headlamps
5. How would you control your vehicle speed following tyre burst?
    A. I must slow down and switch on the emergency lights
    B. I must slowly apply the brake and park
    C. I must remove my legs from the pedals and hold the steering firmly until the vehicle stops by itself
6. How do you join the expressway?
    A. I give way to traffic already on the expressway and then accelerate into either left or right line
    B. I give way to traffic already on the expressway and then accelerate into the right line

C. I give way to traffic already on the expressway and then accelerate into the left line

7. What do you do when the amber light is showing?
   A. I must stop
   B. I must be prepared to stop
   C. I must put the vehicle in reverse
8. How would you handle hazards created by animals or pedestrians?
   A. I must swerve into switch lane without fear
   B. I must make sound judgment in stopping or making other maneuvers
   C. I must apply brake abruptly
9. What do you do when you see '**Chevron Marks'** with broken edge?
   A. I must stop entering the area
   B. I must keep to the right
   C. I must not cross to the left line
10. What do you do when your vehicle breaks down on the highway?
   A. I must activate the hazard lights promptly
   B. I must activate the parking lights and put one triangular retractor 60m from the broken down vehicle and 50m after
   C. I must activate hazard lights and put one triangular retractor 45m from the broken down vehicle and 50m after.
11. What do you do when you see passengers involved in a road accident?
   A. I must move fast to rescue such person
   B. I will move my vehicle away from there
   C. I *must* obstruct the rescuers with ulterior motive

12. What do you do to reduce the severity of road traffic injury?
   A. I always make use of the seatbelt while driving
   B. I always ensure that I carry extra luggage
   C. I always ensure that I move faster to be able to arrive at my destination on time

AFIKUN I

EKA-IMO EKO AGBA

YUNIFASITI IBADAN, IBADAN

ATOJO IBEERE IWADII

Oludahun Owon,

Ise akada ni atojo ibere yii wa fun. Nitori naa, ko si idahun ti o to tabi eyi ti ko to, fun idi eyi, dahun awon ibeere wonyi, pelu doto inu. A o pa asiri awon ero ati idahun re mo daadaa, ati pe fun eredi ise-iwadii yii nikan ni a o lo won fun. A n dupe tori a ni ireti pe e o fowo sowopo pelu wa.

ABALA KIN IN NI: ORO NIPA ARA-ENI

AKIYESI: Jowo di awon alafo wonyi:

Nonba koodu Olukopa.....

Nonba koodu ibudoko.....

Ipa ona.....

Ojo-ori 18-25 ( ) 26-33 ( ) 34-41 ( ) 41-49 ( ) 50-soke ( )

Ipo Igbeyewo:

Esin: Onigbagbo ( ) Musulumi ( ) Omiran.....

Orile-ede: .....

Ipinle Abinibi.....

Iwe-eri eto eko

N ko ni okankan ( ) Ile-Ekoo Alakoobere ( ) Ile-Eko girama ( ) Ile-Eko giga ( )

Se o ni ojulowo iwe ase iwako? Beeni ( ) Beeko ( )

Nigba wo ni o gba a?

Nigba wo ni ko nii see lo mo?

O to igba wo ti o ti n wako? Odun 1-8 ( ) Odun 9-16 ( ) odun 17-24 ( ) Odun 25-32 ( ) odun 33 lo soke

Se o lo si ile eko akoni ni oko wiwa? Mo lo ( ) N ko lo ( )

Bi o ko ba lo, bawo ni o se ni imo iwako?

Wiwo awako ati didanra wo ( )

Awon ore ati ibatan ni o ko mi ( )

Taa ni o ni moto ti o n wa?

Emi (awako) ( ) Okan lara awon omo egbe awako ( ) *Ile ise oloko ero aladaani ( )*

Ile ise oloko ero ti awujo ( )

Amuse Ise

Igbese kin-in-ni: Oluwadii se Idanwo asesaaju fun awon olukopa lori **imo nipa iwa iwako ailewu lenu oko**

EKA-IMO EKO AGBA

AFIKUN II

YUNIFASITI IBADAN, IBADAN

ATOJO IBEERE IWADII

Oludahun Owon,

Ise akada ni atojo ibere yii wa fun. Nitori naa, ko si idahun ti o to tabi eyi ti ko to, fun idi eyi, dahun awon ibeere wonyi, pelu doto inu. A o pa asiri awon ero ati idahun re mo daadaa, ati pe fun eredi ise-iwadii yii nikan ni a o lo won fun. A n dupe tori a ni ireti pe e o fowo sowopo pelu wa.

ABALA KEJI: Ayewo Imo nipa iwa iwako ailewu lenu oko

Ikilo: jowo mu eyi ti o ye fun idahun ninu awon asayan isale wonyi.

1) Gbogbo iwonyi ni o se Pataki ki oko too gbera ayafi OKAN

a) Ri i daju pe digi inu n sise.

b) Rii daju pe apeere ikodoti si mu moto wa laaye re.

d) Ye digi gbogbo wo lara moto ki o si ri i daju pe oju ona to daradara.

2) Ewo ninu awon gbolohun wonyi ni ko salaye nipa iwa iwako ti o dara?

a) Rii daju pe jia oko wa ni ibi ti o ti le gbe oko rin. Ki o to gbera.

b) Maa so beliiti iwako re le daindain ki o si gbera jeejee.

d) Rii daju pe kondokito oko wa ni ijokoo ki o to gbera.

3) Labe akiyesi aabo, okan ninu iwonyi ko se pataki

a) Rii daju pe gbogbo digi oko ni o n sise.

b) Rii daju pe oili inu jia wa ni odiwon ninu enjinni oko.

d) Rii daju pe gbogbo ero kun inu oko fofo ki o too gbera.

4) Ewo ninu iwonyi ni o ye ju ti a ba n ko bireeki oko.

a) Ki a sun mo oko iwaju pekipeki.

b) Duro die, fa bireeki jee ni ona ti o fa ogbon yo.

d) Te bireeki kiakia ati logan, ti o ba wa ni bii mita meji si oko iwaju

5) Ewo ninu iwonyi ni o ye ki a yiri wo ki a to te bireeki oko?

a) Ronu nipa oko ti o wa leyin.

b) Ronu nipa oko ti o wa niwaju.

d) Ronu nipa awon ero inu oko.

6) Gbogbo awon gbolohun isale yii ni o so nipa tite bireeki oko daradara ayafi OKAN

a) Ma se je ki afatelese bireeki gbo ju bi o se ye lo.

b) Ma se sun mo oko iwaju re pupo ju.

d) O le te bireeki oko re ti o ba wa lori ere

7) Ewo ninu awon gbolohun isale wonyi ni o to nipa fifi oko seyin ti o tona?

a) Rii daju pe ko si awon ero ti o n fi ese rin loju ona leyin re.

b) Ma se bikita nipa awon eniyan ti o n fi ese rin leyin re

d) Rii daju pe jia moto re wa ni ipo ti ko le mu oko rin.

8) Ewo ninu wonyi ni ko dara to ti a ba n wako seyin?

a) Wa loju ona pelu ere sisa ti o ga

b) Wa loju ona pelu ere sisa ti o mo niwon

d) Wa loju ona ti o to, ti ko si ni opolopo oko to n rin

9) Ti a ba n wako, gbogbo iwonyi ni o se Pataki ayafi OKAN

a) Rii daju pe awako pa okan re po

b) Rii daju pe o ko toogbe tabi sun lo lenu oko

d) Rii daju pe awako mu bii ife oti lile kan ki o to gbera

10) Kin ni odiwon ere sisa fun oko tasin ati oko ero loju popo.

a) 60 km/hr – ibuso egbeta laarin wakati kan

b) 90 km/hr – Ibuso aadorin-un laarin wakati kan

c) 80 km/hr – ibuso ogorin laarin wakati kan

11) Kin ni odiwon ere sisa fun oko tasin ati oko ero loju ona masose?

a) 90 km/hr – aadorun-un ibuso ni wakati kan

b) 70 km/hr – aadorin ibuso ni wakati kan

d) 100 km/hr – ogorun-un ibuso ni wakati kan

12) Kin ni odiwon ere sisa fun tasin ati oko ero ni aarin ilu ati adugbo.

a) 50 km/hr – aadota ibuso ni wakati kan.

b) 55 km/hr – aadota o le marun-un ibuso ni wakati kan.

d) 60 km/hr – ogota ibuso ni wakati kan.

13) Ewo ninu awon ina atonisona yii ni o n so fun awako ki o duro tabi ki o ma se re koja ni ikorita kan

(a) Pupa nikan

(b) alawo ofeefee nikan

(d) alawo eweko

14) Awon ila meji ti a fa saarin ona tumo si?

a) Ko si ona fun gbogbo onimoto.

b) Ko si ona fun awon oko nla nikan.

d) Ko si aaye irekoja tabi gbigba iwaju mo oko miiran lowo.

15) Nigba ti ila titobi ba wa lori ami P, bii  , eyi tumo si ?

a) O le gbe oko re gunle si ogangan ibe

b) O ko gbodo gbe oko re gunle si ogangan ibe

d) O le gbe oko re sibe fun wakati kan.

16) Ewo ninu iwonyi ni o ye ki a yiri wo ki a to wo oju ona masose?

a) Rii daju pe oko re danga jia lati rin tabi sare ni iyara ti ko mu ewu lowo.

b) Ma bikita fun oko ti o wa ni apa otun re

d) Ma bikita fun oko ti o wa ni apa osi re

17) Ti ila fife ba wa lori ila akoro ti o doju bole bii  ,eyi tumo si?

a) O leyi oko re po

b) O ko gbodo yi oko re po

d) Ago olopaa wa ni itosi re

18) ti o ba n wako ni agbegbe ile iwe, kin ni o ye ki o se?

a) fi kun ere sisa re

b) Da oko re duro

d) Din ere sisa re ku

19) Ewo ninu awon igbese wonyi ni o ye fun yiya oko iwaju eni sile ni ona ti ko mu ewu lowo?

a) Ya oko iwaju sile ni apa osi nigbati lilo bibo oko ba po gan-an.

b) Ya oko iwaju sile ni apa otun nigba ti ko si lilo bibo oko rara.

d) Ya oko iwaju sile ni apa osi nigba ti ko si lilo bibo oko rara.

20) Ewo ninu iwonyi ni o tona nigba ti a ba n ya oko iwaju eni sile?

a) Ma se bikita nipa oko ti o wa niwaju re.

b) Fi Kun ere sisa re ki o si sun mo oko iwaju re pekipeki.

d) Rii daju pe ko si oko kankan to n bo niwaju, ki o si fi oko sare.

21) Ewo ninu awon gbolohun wonyi ni o se apejuwe oko wiwa ni opona masose

a) Sisare koja iwon ote ere sisa

b) Mimaa baa won ero inu oko soro ti oko ba wa lori irin

d) Wiwa ni abala ibi ti o ye ki oko re wa, ki o si maa rin jeje loju ona

22) Ewo ninu awon wonyi ni o daabo bo awako ninu oko re?

a) Digi egbe oko mejeeji nita

b) Beliiti aabo awako

d) Digi inu moto

23) Ewo ninu iwonyi ni o din isele gbonmogbonmo ijamba moto oju popo ku?

a) Irorin eyin aga ijokoo awako

b) Dasiboodu

(d) Beliiti aabo awako

24) Ewo ninu iwonyi ni o fi kun ijoko daradara ati itura awako?

a) Aga Ijoko awako

b) Beliiti aabo awako

d) Digi egbe moto nita

25) Ewo ninu iwonyi ni o ndin ipa-okan-po awako ku, ti o si maa n fa ikobi-ara-si re seyin?

a) Digi ati gilaasi nla iwaju oko

b) Oogun oloro ati oti lile

d) Beliilti aabo awako ati dasiboodu

26) Ewo ninu iwonyi ni odiwon ti o ga ju fun ipele oti lile fun awako.

a) 0.05% = (ida marun-un ayewo oti lile ninu eje)

b) 0.50% = (ida aadota ayewo oti lile ninu eje)

d) 0.005%= (ida ookan odin die ayewo oti lile ninu eje)

27) Ewo ninu iwonyi ni o ni ipa lori iwoye ati idajo awako?

a) Aisan (b) Enjinni moto (d) Oogun oloro ati oti lile

28) Iwonyi ni a gba nimonran fun iwako asale ti ko mu ewu lowo AYAFI.

a) Yi ina iwaju moto re sile nitori moto ti o wa ni iwaju re.

b) Ma se te oju mo ina moto ti o n bo niwaju re.

d) Mu ere moto re po si i die ti o ba ti koju si oko ti o n bo ni iwaju.

29) Iwonyi ni o n gba ni nimonran fun iwako ti ko mu ewu lowo ninu kurukuru tabi eefin AYAFI.

a) Yi ina iwaju moto re sile patapata.

b) Din ere sisa re ku.

d) se akiyesi awon oko niwaju ati leyin re

30) Ewo ninu iwonyi ni a gbodo gba awako niyanju lati se ni akoko iwako isinnilona tabi ito-lowoowo?

a) Wiwako ni deede ote ere sisa ati fifi aaye sile laarin oko kan si ekeji.

b) Igbani nimoran fun ere asapajude.

d) Sisa ere ni odiwon eyi ti o wa fun akanse.

31) Iwonyi ni awon amuye awako ti o ni ipinnu ayafi OKAN.

a) Imo kikun nipa ofin ilana iwako loju ona.

b) Fi aaye sile fun aipe ti ara eni.

d) Maa foju sona fun gbese awon ero oko.

32) Awon nnkan wonyi ni orisun iwa iwako ti o ni idiwo AYAFI

a) Mimaa lo ero ibanisoro.

b) Mimaa wo bi egbeegbe ona se ya kaakiri.

d) Ki awako ma se ronu nipa idiwo lati ode.

33) Iwako ti o ni aabo nii se pelu ewo ninu iwonyi.

a) Sise amulo ogbon iwako ti o ni aabo lati se idamo, isotele ati yago fun ijamba oniruuru ewu lenu oko wiwa.

b) Mimaa sare ni ibamu pelu bi agbara enjinni oko se le sise to.

d) Sise amulo ogbon iwako ti ko lewu lati se idamo imehe yoowu ti o ba waye ti a ba n wako.

34) Iwonyi ni ero itoju akoko fun awon ti o se konge ijamba loju popo AYAFI;

a) Lati se itoju emi eni ti o sese.

b) Lati mu ipo ti eni naa wa kuro.

d) Lati din iye owo itoju eni ti o fara pa ku.

35) Awon igbese wonyi ni o ye ki awako ti ko si ninu ijamba gbe ayafi OKAN

a) Gbe amin “SE PELE” si ogangan ibudo ijamba lati dena ewu miiran

b) Pe nomba 122 tabi 112 tabi nomba pajawiri miiran fun iranlowo

d) Pe bo awon ti o wa ninu isele naa pitimu.

AFIKUN III

EKA IMO EKO AGBA
YUNIFASITI IBADAN, IBADAN
ATOJO IBEERE IWADI

Oludahun owon,

Ise akanse ni atojo ibeere yii wa fun. Nitori naa, ko si idahun ti o to tabi eyi ti ko to, fun idi eyi, dahun awon ibeere wonyi pelu ooto inu. A o pa asiri awon ero ati idahun re mo daadaa, ati pe fun eredi ise – iwadi yii nikan ni a o lo won fun. A n dupe tori a ni ireti pe e o fi owo sowo po pelu wa.

ABALA KETA: **Atojo ibeere iwadii lori ikobi-ara-si iwa iwako ailewu**

Akiyesi: Jowo ka, ki o si ronu nipa awon gbolohun wonyi daradara. Nigba naa, gbolohun kookan yo so yala;

- O fara mo-on daradara
- O fara mo-on
- O ko fara mo-on
- O ko fara mo on rara

Nomba	**Ibeere**	**Mo fara mo-on gan-an**	**Mo fara mo-on**	**N ko fara mo-on**	**N ko fara mo-on rara**
1	Mo fe lati maa sare wako nitori pe ki i jo mi ni epo				
2	Mo maa n saaba fe lati wako mi sunmo moto to wa niwaju mi lati ma je ki oko miiran wo-o mo mi lowo				
3	Mo maa n saaba fe lati sare wako lati le tete gunle.				
4	Mo maa n lo beliiti aabo nigba ti mo ba ri i pe o wu mi lati lo o				
5	Mo maa n fe lati gbo orin ti mo ba n wako lo si ona jinjin nitori o maa n mu ki okan mi bale ki ara mi si ya gaga.				
6	Mo maa n fe lati mu siga ti mo ba n wako.				
7	Mo maa n fe ri i daju pe digi egbe tabi ti inu n sise deedee ki n to bere si wako.				

8	Mo maa n fe lati se iranwo fun eni ti o ba wa ninu ijanba moto ti mo ba ri i pe ko le mu idaduro lowo				
9	Mo maa n fe lati se ayewo eya ara oko mi daradara ti mo ba ri apere ise ti o n se loju popo				
10	Mo maa n fe lati je obi, pako tabi singoomu lati le ma sun ti mo ba n wako.				
11	Mo maa nfe lati maa yipo tabi lori oko loju ona masose ti aaye ba gba mi.				
12	Mo maa nfe lati maa mu oti lile ti mo ba n wako nitori pe o maa n fun mi ni agbara lati wako daradara.				
13	Mo maa n fe lati maa pe tabi gba ipe lori ero ibanisoro alagbeeka ti mo ba n wako.				
14	Mo maa n fe lati wo ohun ti o n lo lebaa ona ti mo ba n wako				
15	Mo maa n fe ki awon awako yooku rii pe mo le fi oko dara loju popo				
16	Mo maa n fe lati mu agbo opa eyin ti mo ba fe wako lo si idale tabi ona jinjin				
17	Mo maa n fe lati ba ero oko soro ti oorun ba n kun mi.				
18	Mo maa n fe lati wa oko siwaju lai ka ipo ti oko iwaju mi wa si, nigba ti mo ba fee ya a sile				
19	Mo maa n fe din ere oko mi ku nigba ti mo ba ri awon eso oju popo.				
20	Mo fe lati ko sii nipa awon ami awako oju popo.				

AFIKUN IV

EKA-IMO EKO AGBA

YUNIFASITI IBADAN, IBADAN

ATOJO IBEERE IWADII

Oludahun Owon,

Ise Akada ni atojo ibeere yii wa fun. Nitori naa, ko si idahun ti o to tabi eyi ti ko to, fun idi eyi, dahun awon ibeere wonyi pelu ooto inu. A o pa asiri awon ero ati idahun re mo daadaa, ati pe fun eredi ise-iwadii yii nikan ni a o lo won fun. A n dupe tori a ni ireti pe e o fowo sowo po pelu wa.

ABALA KERIN; Ayewo Iwa iwako ti o ni ewu ninu

Ikilo; Jowo fi ami (√) sinu alafo ti o fi ero okan re han si awon ibeere isale wonyi.

Nomba	**Ibeere**	Ni opo igba	Leekookan	Rara, ko ri bee
1.	Mo maa n mu oti leekookan ki n too bere oko wiwa			
2.	Mo maa n saaba mu siga ti mo ba n wako			
3.	Mo maa n pe tabi gba ipe ero alagbeeka ti mo ba n wako			
4.	Mo maa n saaba fe wako ti o ba ni ero redio ati telifisan			
5.	Mo nifee si wiwa oko ni ale ti mo ba ti ri nnkan mimu			
6.	Mo fe lati maa mu bii opa egboogi kan ki n too bere sii wako paapaa si ona jinjin			
7.	Mo maa n baa won ero oko mi takuro so ti mo ba n wako			
8.	Mo maa n boju wo egbeegbe ona,awon ohun ti o wa nita,ati awon ero ona ti mo ba n wako			
9.	Mo maa n saaba ya oko iwaju sile ni igun ona ati ibi ti ona ti degbe nitori pe mo n kanju			
10.	Ni opo igba mo maa n ro pe ofin irinna nira pupo lati tele ti mo ba n wako			

AFIKUN V

EKA-IMO EKO AGBA

YUNIFASITI IBADAN, IBADAN

ATOJO IBEERE IWADII

Oludahun Owon,

Ise akada ni atojo ibere yii wa fun. Nitori naa, ko si idahun ti o to tabi eyi ti ko to, fun idi eyi, dahun awon ibeere wonyi, pelu doto inu. A o pa asiri awon ero ati idahun re mo daadaa, ati pe fun eredi ise-iwadii yii nikan ni a o lo won fun. A n dupe tori a ni ireti pe e o fowo sowopo pelu wa.

ABALA KARUN UN: Igbelewon nipa iriri iwako

Ikilo: jowo mu eyi ti o ye fun idahun ninu awon asayan isale wonyi

1) Kin ni o maa nkoko se ki o to bere sii wako?

a) Maa rii daju pe iwe oko mi wa ni itoju ninu oko.

b) maa so beliiti awako mora, ti n o si maa fi suuru gbera oko,

d) Maa so beliiti awako mora, wo digi otun ati tosi, rii daju pe oju one da, n o si rora maa lo.

2) Ti o ba n fi eyin oko rin, ti o kosi lee ri eyin daradara, kin ni o maa se?

a) Maa tan ina iwaju oko mole pupo, n o si maa rora fie yin oko rin lo.

b) Maa wa enikan ki o to mi sona.

d) Maa tan ina idi oko ti o nse afihan iwako seyin, n o si maa roar feyin rin lo.

3) Bawo ni iwo gege bi awako yo se se akoso ijanu oko ti o dede so ise sile lori ere?

a) Maa po efatelese ijanu lati mu ki o ga soke sii.

b) Maa fa bireeki afowofa logan.

d) Maa pa ina oko ki n si paaro ipo ti jia moto wa diedie.

4) Bawo ni o se maa wako labe kurukuru tabi eefin?

a) Maa ya kuro loju ona kiakia.

b) Maa din irin oko ku, ki n si yi ina iwaju oko sile die.

d) Maa din irin oko ku, ki n si yi ina iwaju oko soke tan patapata.

5) Ti taya oko re ba fo lori ere, bawo ni oo se sakoso oko re?

a) Maa din ere oko ku n o si tan ina pajawiri ara oko.

b) Maa fi suuru te bireeki oko, n o si duro diedie.

d) Maa gbe ese mi kuro lara awon ohun ti a fi n dari oko nisale, n o si di idari oko mu sinsin titi oko yoo fi duro.

6) Bawo ni o se maa n wako wo ona masose?

a) Maa fi aaye sile fun awon oko loju ona masose, n o si wako wo apa otun tabi apa osi.

b) Maa fi aaye sile fun awon oko loju ona masose, n o si wako wo apa otun.

d) Maa fi aaye sile fun awon oko loju ona masose, n o si wako wo apa osi.

7) Kin ni o maa se ti ina ofeefee ba tan?

a) Mo gbodo duro

b) Mo gbodo mura lati duro

d) Mo gbodo fi oko si wiwa seyin

8) Bawo ni o se maa sakoso ewu ti eranko tabi awon to n fese rin ba mu wa?

a) Maa yan enu oko si apa ibomiran lai beru.

b) Maa yara ro ohun ti o ye lati se ti yo yo mi ninu ewu boya ki n duro lojiji tabi yiwo si ibomiran.

d) Maa te bireeki lojiji

9) Ti o ba ri ami V pelu ona gbongun gbongun, kin ni o maa se?

a) Maa duro n ko si nii wo inu re.

b) Maa ya si apa otun.

d) N ko gbodo ya si apa osi.

10) Kin ni o maa se ti oko re ba baje si opopona nla?

a) Maa tan ina ti on fi “ewu wa” han logan.

b) Maa tan ina keekeekee ara oko sile, maa si fi opa onigun meta onitansan sile lookan ibi ti moto wa niwaju ati leyin.

d) Maa tan ina asafihan ewu pelu opa onigun meta onitansan, ni iwon ese bata marundinlaadota lati ibi ti oko baje si ati ese bata aadota si iwaju re.

11) Kin ni o maa se ti o ba ri ero oko miiran ti o wa ninu ijamba oko?

a) Maa yara lati doola iru eni bee.

b) Maa yara wa moto mi kuro ni itosi ibe.

d) Maa di awon adoola emi lowo lati kuro ni itosi ibe.

12) Kin o maa n se lati din ijamba oko oju popo ku?

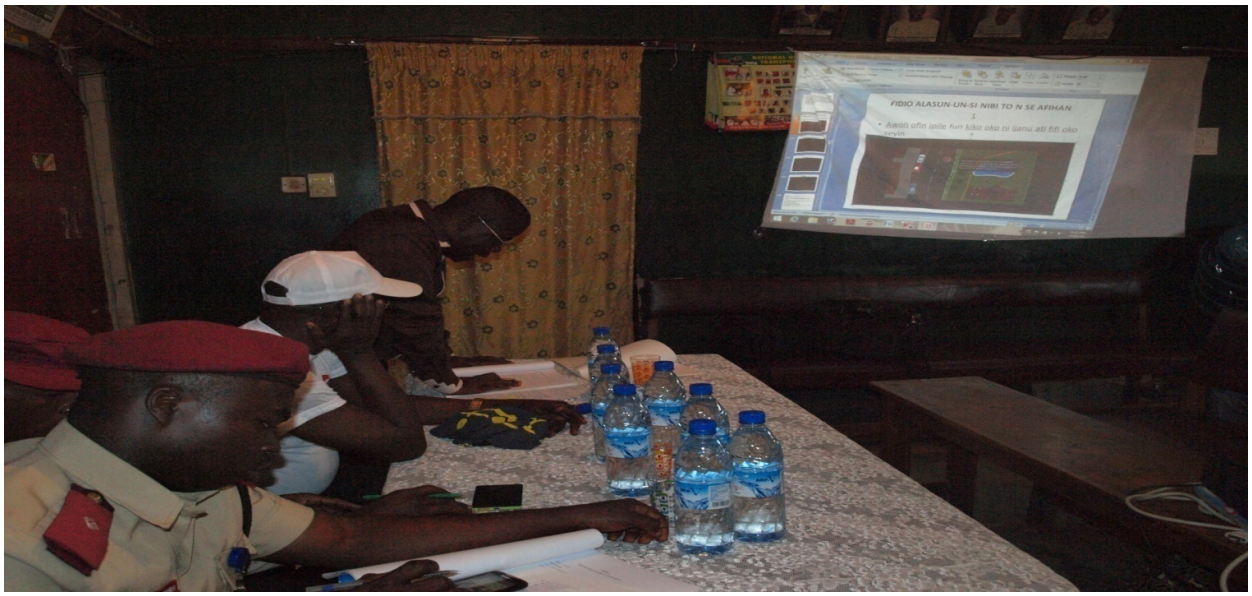
a) Mo maa n lo beliiti aabo awako ti mo ba n wako

b) Mo maa n rii daju pe mo gbe ero ati eru ju iwon ti o ye lo

d) Mo maa n rii daju pe mo fi oko sare lati le tete gunle si ibi ti mo n lo

APPENDIX

Training Session at Ojoo Motor Park



Another training session with the officials of the FRSC and commercial drivers at Ojoo Motor Park, Ibadan. Nigeria

Another training session at Ojoo Motor Park with the researcher facilitating

Drivers watching video clips and asking relevant questions

Training session at Iwo Road Motor Park

Cross section of drivers watching video clips at the training centre

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Participants, FRSC Officials and Researcher at Iwo Road Motor Park

Researcher, FRSC Officials and NURTW Iwo Road Branch Executives

Researcher and One of the FRSC Officials during training at Ojoo Motor Park

One of the training sessions at Ojoo Motor Park