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# PREVALENCE OF AUTOMOBILES ROAD TRAFFIC ACCIDENTS IN NIGERIA: THE IMPERATIVE OF INTEGRATING ROAD SAFETY EDUCATION (RSE) INTO AUTOMOBILE TECHNOLOGY EDUCATION

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## Abstract

*This paper aimed at reviewing literature on road traffic accidents at global perspective and at national level on how grave the menace is affecting human. The paper reviewed factors influencing road traffic accidents, road traffic accidents involving automobiles in Nigeria, road users vulnerable to road traffic accidents, the need for road safety education as recommended by previous studies and the need for integrating road safety education into automobile technology education. Among the recommendations proffered by the paper are: Relevant stakeholders should in a matter of urgency to fully incorporate RSE into the ATE curriculum at both NCE and B.Tech. Ed. levels. FRSC should extend their awareness campaign from secondary school down to children in nursery and play class as is being done in some developed countries.*

**Keywords:** Traffic, Accident, Automobile, Safety, Education

## Introduction

Before the arrival of automobiles, man used animals as a means of transportation, and in recent times transportation on land is commonly with automobiles and trains (Faajir & Hassan, 2016). But the collapse of the railway system in the Nigerian transport sector about long ago has given rise to the number of road commuters and as well, the movement of goods and services within Nigeria with the use of automobiles make all the highways congested with traffic (Onyemaechi & Ofoma, 2016; Jaiye & Elisha, 2020). It has been observed by Nelson (2017) that automobiles have become one of the major means of road transportation across the globe. This is confirmed by The Nigerian Bureau of Statistics (N.B.S., 2017), where the bureau recorded that in Nigeria alone, there were about 11.8 million registered vehicles, with the then population of 198 million people putting the vehicle per population ratio at 0.06. With a total of road network of 194,394 km in Nigeria (Onyemaechi & Ofoma, 2016) one may think that the roads are sufficient for the vehicles. But most of these roads were built more than 30 years ago when the volume of vehicular traffic was low (Adeniran & Yusuf 2016 and Oroleye, 2019). This might be the reason why Afolayan et al. (2017) averred that in Nigeria, growth in urbanization and increase in number of vehicles have led to traffic congestion on highways and consequently to road traffic accidents. In the same vein, Hu et al. (2020) confirmed that roads with over populated traffic are more complicated due to mixed traffic flows, traffic situation and other instances that could lead to road accidents. Therefore, the risk of increase in Road Traffic Accidents (RTAs) in Nigeria may persist with current number of automobiles and deplorable road condition.

Onokala (2015) viewed Road Traffic Accident (RTA) as an unexpected and unpleasant event that causes loss or injuries to passengers, vehicles and other mobile or immobile facilities along a road. Shantajit et al. (2018) viewed RTA as a fatal or non-fatal incident sustained as a result of a collision or event involving at least one road vehicle in motion on a public road or private road to which the public has right of access resulting in at least one injured or a killed person. Based on the definitions, it is obvious that RTAs have serious implications for the health of those involved as well as financial costs and also involve the risks of death. United Nations (U.N., 2018) reported that the staggering statistics of the millions of persons killed and injured each year from RTAs have continued to rise. The report indicated that by the year 2030 post-injury death due to RTAs across the world could significantly increase. The worrisome aspect is that 90% of the RTAs statistics are from developing countries like Nigeria, and causes death for those below the age of 45 (Ullah et al., 2021). It was reported that every year over 39,000 Nigerians die from road traffic crashes. Therefore, the estimated rate per 100,000 deaths stood at 21.4 (World Health Organization (W.H.O.), 2019; W.H.O., 2018; Onyemaechi & Ofoma, 2016; Faajir & Hassan, 2016). Also, in Nigeria, injuries and deaths resulting from RTAs are on the rise and are Nigeria's third-leading cause of overall deaths, the leading cause of trauma-related deaths and the most common cause of disability (U.N., 2018 and Federal Republic of Nigeria F.R.N., n.d). Globally, around 1.35 million human lives are lost due to road traffic crashes every year. Moreover, injuries and disabilities caused by automobile accidents lead to further widespread of problems that increasingly traumatize not only the people involved in it but the people who depend on them too (Ullah et al., 2021; W.H.O., 2019).

Road traffic crashes cause not only grief and suffering but also economic losses to victims, their families, communities and nations as a whole (W.H.O., 2021 and Marzooq, 2021). Indirect costs, such as loss of productivity, damage to vehicles and property, reduced quality of life and other factors must also be included in calculating the true cost to society. In Nigeria, about 80 billion naira is lost to RTAs annually (U.N., 2018). This economic cost

includes the cost of property and public amenity damaged, the cost of medical treatment, and the cost of productivity lost due to the accident. This is a huge economic loss particularly for a country plagued with economic hardship. Furthermore, the economic consequences of automobiles crash have been estimated between 1% and 3% of the respective Gross National Product (GNP) of the world countries, reaching a total over USD500 billion with USD100 billion of that occurring in poor and developing countries (Coleman, 2014; W.H.O., 2019). This indicated that, the overall effects of these injuries constitute social, economic and psychological losses of great magnitudes. It was highlighted that a troubling issue in Nigeria is that the majority of victims of road crashes are young persons who constitute the bulk of the economic workforce of the nation (Onyemaechi & Ofoma, 2016; U.N., 2018). Although there have been some reasonable efforts put in place by the Nigerian government through Federal Road Safety Corps (FRSC), Traffic Police and other relevant agencies in reducing the menace of RTAs, but still there is need for more hands to come in. That is why it will be of paramount importance for relevant stakeholders to consider integrating Road Safety Education (RSE) into Automobile Technology Education (ATE) curriculum of tertiary institutions. This is because, the more potential road users have knowledge on road safety, more lives will be saved.

### **Factors Influencing Road Traffic Accidents**

It will be of paramount importance and life-saving if factors responsible for RTAs are identified empirically before further action. This is because, Xie et al. (2020) suggested that understanding the factors that contribute to traffic crashes can help provide a fundamental basis to plan and develop appropriate countermeasures for road safety issues. Therefore, it is necessary to comprehensively understand the various risk factors contributing to road accidents involving automobiles in Nigeria, so that appropriate safety interventions can be identified and implemented to reduce the frequency of these accidents. Afolayan et al., 2017, Naing, et al. (2018) and Akande (2020) classified factors influencing RTAs into three levels: human level, vehicle level and environment level. Human level factor include: over speeding/reckless driving, safety violation, aggressive driving and loss of consciousness. Also, at vehicle level the factors include: acute technical failure and tire blow-out. Lastly, at an environment level the factors include traffic density, traffic flow, slippery road conditions, road sign system and adverse weather conditions.

Over speeding and reckless driving were found to be major causes of RTAs (Al Turki, 2014; Al-Zahrani et al., 2014; Talal, 2015; Naing, et al., 2018 and FRN, 2018). Similarly, driving safety violation like, non-compliance to seat belt usage was found to be primary factor associated with high incidence and severity of RTAs (Jawadi et al., 2017; Jamal et al., 2019; Alghnam et al., 2019 and Mazyad et al., 2021). In the same vein, Talal (2021) observed that adequate training of automobile drivers increases drivers' competence and makes them more cautious of traffic regulations. But Lack of maturity and sufficient driving experience increases the risk of traffic accidents especially among novice drivers (Nithya & Revathi, 2019; Hu et al., 2020 and Li et al., 2021). In another development, some studies indicated that vehicle related factors like grave technical failure and tire bursting correlated with RTAs (Gbadamosi & Adenigbo 2017; Berhe et al., 2020; Ezeifeke & Ogbogu, 2021 and Nnabuihe & Tight, 2021). Lastly, numerous studies have shown a positive effect of road environment factors on RTAs (Peter, et al., 2017; Ezeibe et al., 2019; Oroleye, 2019 and Ezeifeke & Ogbogu 2021). Among all the factors highlighted by the literature, it was pointed out that human is the key factor leading to traffic accidents. Moreover, human constituted the pedestrians passengers and other road users (Mekonnen et al., 2019; Akande, 2020; Jin et al.,

2021; Marzooq, 2021 and Choudhary et al., 2022), hence the need for RSE to potential road users.

### **Road Traffic Accidents Involving Automobiles in Nigeria**

Despite efforts by relevant law enforcements in Nigeria, still RTAs lingered on Nigeria roads (Onokala, 2015; Afolayan et al., 2017 and Akande, 2020). Nigeria had regularly been ranked as having the highest incidents of road traffic accidents in the world (Kolawole, 2015). In the same vein, Onokala (2015) stated that in the 1980's Nigeria had one of the highest rates of deaths from RTAs in Africa leading 52 other nations in the number of deaths per 10,000 automobile crashes. In comparison with RTAs in the more developed countries of the world the high accident and fatality rates in Nigeria were so high that the situation was alarming. Onokala further expatiated that by 1987, Nigeria topped the list of 38 countries worldwide with the highest record of death by road traffic accidents with the chances of a vehicle killing someone on Nigerian roads being 47 times higher than in Britain. By 1995, Nigeria had fewer than one million vehicles and RTA fatalities were about 20 times that of the United States of America with 100 million vehicles. It was estimated that 2 out of 5 of deaths in the country were due to road traffic accidents. Also, between 1990 and 2012, 337,301 RTAs were recorded in Nigeria (Kolawole, 2015). It was around the year 2012 W.H.O. listed Nigeria among countries in the world with unsafe roads, with 162 death rate per 100,000 populations from RTAs (W.H.O., 2018). The statistics includes people that are inside and outside the vehicle, comprising; motorcyclists, bicyclists, pedestrians and other non-motorized road users who were probably going about their business before they were struck by vehicles (W.H.O., 2018). In separate studies carried out by Chinebuli (2014) and Olojede et al. (2016) they declared that according to official Federal Road Safety Commission (FRSC) figures, 9,946 people were killed in 20,530 RTAs in 2014, representing a slight decline in comparison with the death toll recorded in previous years. The decline in RTAs was recorded due to the establishment of Driving School Standardization Programme (DSSP) from 2010 to 2014 (Boboye, 2018). The recent records show that the road traffic crashes, the number of persons killed and the number of persons injured had been inconsistent in recent years due to problems in accidents scene data collection and or collation (Federal Republic of Nigeria (FRN, n.d).

### **Road Users Vulnerable to Road Traffic Accidents**

There are certain road users who are at most risk on roads across the globe, this particularly be the case in developing countries where rapid motorization is likely to occur over the next two decades (Peter et al., 2017). The World Bank (2014) and W.H.O. (2014) reported that a substantial portion of the burden of injury and death will continue to be among passengers, vulnerable road users: pedestrians, cyclists, motorcyclists and other non-motorized road users. This was found to be very common in low-income and middle-income countries (Nigeria inclusive) due to many reasons, such as lack of separating pedestrian from other road users, traffic mix and fast-moving motorized vehicle (W.H.O., 2018; Mohammed et al., 2020). So far in Nigeria, efforts are still limited in scope and coverage with regard to Road Safety Education (RSE). The limited scope of the RSE was that the scope encompassed mainly on the vehicle operators leaving out other vulnerable groups such as: children, students, pedestrians, the elderly and physically challenged (Sumaila, 2013). Despite the fact that RTAs claim lives of more passengers and other road users than drivers (Dike, et al., 2017) and on the average eight road users are killed along side with only one driver (Boboye, 2018), still educating vulnerable road users is not adequately prioritize.

All types of road users are at risk of being injured or killed in a road traffic crash, but there are notable differences in fatality rates between different road user groups (Osayomi,

2013). In particular, Mohammed et al. (2020) confirmed that the vulnerable road users such as pedestrians and two-wheeler users are at greater risk than vehicle occupants and usually bear the greatest burden of injury. They further emphasized that the particular concern is the mix between the slow-moving and vulnerable non-motorized road users, as well as motorcycles, and fast-moving, motorized vehicles. Hence, there should be separate tracks between slow and fast-moving vehicles. There have been noticeable differences in fatality rates between various groups of road users, as well as between road users in high-income countries and those in low-income and middle-income countries (Bailey et al., 2022). In a review of 38 studies by Elnibras et al. (2017) found that pedestrian fatalities were highest in 75% of the studies, accounting for between 41% and 75% of all fatalities. They further indicated that passengers were the second largest group of road users killed, accounting for between 38% and 51% of fatalities. Also, Peter et al. (2017) reported that in Kenya, pedestrians represented 42% of all crash fatalities; pedestrians and passengers combined accounted for approximately 80% of all fatalities in that country each year. Peter et al. further indicated that in the city of Nairobi alone, 64% of road users killed in traffic crashes were pedestrian.

Recent studies have shown that pedestrians and motorcyclists have the highest rates of injury in Asia (Sherwood & Goldsworthy, 2015; Abdul Manan et al., 2018). Also, in African countries, specifically Nigeria, pedestrians, passengers in mass transportation and other road users have become most affected by RTAs (Gbadamosi & Adenigbo, 2017; Akande, 2020 and Adepoju, 2021). More so, Wanyama et al. (2016) claimed that in Latin America and the Caribbean, injuries to pedestrians and other non-motorized road users are of the extreme problems. But, in most developed countries, such as France, Germany and Sweden, car occupants represent about 60% of all fatalities, a reflection of the greater number of motor vehicles in use. While there are fewer motorcyclist, cyclist and pedestrian casualties (Schepers et al., 2014). This is in line with the report of International Road Forum (IRF, 2021) who reported that in several low-income and middle-income countries, passengers in buses and other informal public transport systems constitute a significant group at high risk of road traffic casualties.

In a little contrast to the above findings, Akande (2020) found that only 47% of the commercial bus drivers in Abuja make an obscene gesture, intimidate other road users through unnecessary use of horn and abusive words, also, only 38% displayed the same attitude in Lagos. But in the case of yielding for pedestrians and other vulnerable road users, Akande found that only 26% of bus drivers in Lagos stop for pedestrians when they are in a hurry and 40% of drivers in Abuja. From all indications, the percentage of drivers that yield for pedestrians in Abuja is higher than that of drivers in Lagos. This was because a significant percentage of Abuja drivers attended school. There are different factors identified by Leta (2020) as causes of injury severity to the pedestrians and other road users in either urban, rural or highways in African countries. The principal factor was found to be driver-related factor, which could be strongly attributed to: driver experience, education level, driver age, speeding, gender, and road rage. Based on the Leta (2020)'s opinion a driver may relate badly or negatively with other road users when having one or more of the mentioned factors.

### **The Need for Road Safety Education as Recommended by Previous Studies**

Road Safety Education [RSE] (also known as Traffic Safety Education) can be defined as any permanent educational action that stimulates the development of knowledge, skills, habits, behaviors, values and attitudes that improve the behavior of pedestrian, passenger or driver (in other words, every potential road user) with the ultimate aim of reducing the



potential risk of suffering an accident and, ultimately, its rates (Alonso, Esteban, Useche, & Manso, 2016; Alonso, Esteban, Tortosa, & Useche, 2017). There is a difference between the concepts of road safety education and road training, it is necessary to clarify that, unlike the "road training", which is normally focused on drivers, road safety education affects all road users (e.g., passenger, pedestrian, driver, etc.). In contrast, road training only affects the user who is a driver. In this sense, road safety education extends throughout the lifetime and must be present in all developmental scenarios of the individual, including the educational system (Alonso, Faus & Useche 2022). World Health Organization (W.H.O., 2019) revealed that around the world, there is a noticeable need for the road safety education. W.H.O. further explained that educating the public on road safety issues represents one of the major current concerns of nations. This was in line with so many literatures that recommended RSE as a tool for reducing the rate RTAs across the globe.

Sumaila (2013) opined that RSE is the only instrument that can be used to change road users' behaviour and attitudes. Sumaila further suggested that countries should go back to the basics by incorporating safety education into schools curricula. There are wealth of researches in Nigeria, Africa and across the globe that share this same view. For instance, in Nigeria, Osime et al. (2016) in their study recommended that various RSE programmes should be organized for different road users. Also, Olojede et al. (2016) in their study recommended that there is need for educating drivers, passengers and general public on road safety and security. In the same vein, Okafor et al. (2014) suggested that RSE combined with on-road training improves driving performance and increases safety awareness. Similarly, Okafor (2010), Olumide and Owoaje (2016) and Akande (2020) revealed from their separate studies that RSE resulted in an immediate increase in road safety knowledge, change road user's attitude and consequently reduces RTAs. In African context, Berhe et al. (2020) and Leta (2020) in their separate studies concluded that education on traffic laws and regulations should be given to drivers and potential road users constantly.

In global context, so many researches recommended RSE as an ingredient that could reduce the rate of RTAs. In a study conducted by Liet al. (2021) in Hunan China, they suggested that there should be road safety education and training of drivers and general public. Also, in their recommendation Jin et al. (2021) stated that to improve road traffic safety and threat of accidents to road users, there is need for training and educating the potential road users. In a study carried out in the Kingdom of Saudi Arabia, Yagoub et al. (2021) recommended that there is need for continuous educational initiatives to develop and encourage a sound driving culture and sound attitudes among adolescents and young adults at the tertiary educational level. There was emphasis that an effective prevention policy of frequency of accidents, mortality, and disability should be based on RSE targeted to general road users (Al-Naami et al., 2010; Mansuri et al., 2015; Ishag & AlMater, 2018). Similarly, Sultan et al. (2016) in their study recommended that Malaysian government by its agency should make RSE part of teacher education. In Pakistan, Riaz and Shahid (2018) indicated that inadequate knowledge on RSE among the drivers and road users trigger the rate of RTAs in the area they carried out the study. In India, Shantajit et al. (2018) and Choudhary et al., (2022) in separate studies have recommended RSE of drivers and traveling public to be prioritized. A study in U.S by Pisano, Goodwin and Rossetti (n.d) suggested that there should be increase in driver education and awareness of weather impacts in order to reduce rate of RTAs. In scientific evidence collected in his paper, Assailly (2017) showed that RSE have some positive effects if good practices are adopted, if it is part of a lifelong learning process. Based on the above, RSE was found to be key factor that should be fully integrated into school curriculum. As opined by Alonso, Esteban, Useche, & Manso, (2016) RSE will be

essential for all road users with more and diverse high risk factors which may explain the occurrence of road accidents, such as young adults.

### **Why Integrating Road Safety Education into Automobile Technology Education?**

Automobile Technology Education (ATE) is one of the Technical Vocational Education and Training (TVET) courses studied in tertiary institutions in Nigeria. The course is studied at National Certificate in Education (NCE) level and at Bachelor of Technology Education (B.Tech. Ed.) level. ATE is a course that enables the students to test, diagnose, service and repair any fault relating to conventional automobile main assembly units and systems to the manufacturers specification (Inti et al., 2014). It has been observed by Ademola (2014) that automobile industry plays significant roles in the manufacture of cars, commercial vehicles, motorcycles, bicycles and boats, tricycles, agricultural implements and their component parts. Hence, it is seen as an engine of growth in any economy because of the important roles it play in the execution of various activities. Despite these advantages, automobile become a major agent of RTAs in Nigeria. One of the recommended ways of reducing the menace of RTAs by researchers was through RSE. Riaz et al. (2019) made it clear that RSE is among one of the five E's for increasing traffic safety, which are: Encouragement, Enforcement, Evaluation, Engineering and Education. Also, training and education are pillars of road safety strategies and solutions for increasing road safety. That is why in most of the countries in the world road safety education is, to a certain extent, part of formal education system (Topolšek et al., 2019). Hence there is need for RSE to be fully integrated into the ATE curriculum, so that more number of people will become literate in terms of road safety. Martos et al. (2014) are on the opinion that it could be very useful to provide more opportunities for adults, to allow them gain more knowledge concerning road safety through training in an institutional setting.

Akinmusere and Oladunmoye (2011) claimed that RSE is currently being taught in some tertiary institutions, particularly in the Universities and degree awarding Colleges of Education. Yet, the authors failed to categorically specify the schools and under which course(s) RSE is taught in the said institutions. In ATE at B.Tech. Ed. level, high way code is taught as a course while at NCE level, vehicle driving is taught as a course. Despite the presence of these courses in ATE curriculum, yet the content of these courses seem to be insufficient to cover the rudiments of RSE. This is because according to Assailley (2017) the objectives of RSE should be: 1. Promotion of knowledge and understanding of traffic rules and situations, 2. Improvement of skills through training and experience, 3. Strengthening and/or changing attitudes toward risk awareness, personal safety and the safety of other road users. But, fully integration of RSE into ATE course curriculums at both B.Tech. Ed. and NCE level could solve the issue of the deficit.

In another development, there were claims that driving schools in Nigeria failed to provide necessary learning environment to their learners, therefore producing half-baked drivers. For instance, F.R.N. (2013) mandated that a proper driving school should have a simulator, driving range, workshop and qualified instructors. In another claims by Boboye (2018) and Ashiru (2019), indicated that some driving schools also compromise by giving out certificates to learner drivers without offering them the required theory and practical training before being pushed to the Driver License Centre for license processing. Most of driving schools in Nigeria have no classes, administrative block let alone a library (Adetayo, 2020) claimed. In a similar tone, Aghdam, et al. (2020) found that the general academic course on traffic safety must be taught by trained teachers in universities for related fields of study. They further found that driving is not just about introduction to driving skills, the correct behaviors and rules related to traffic both as a driver and as a potential road user must be

taught to majority of populace through standardize schools environment. Despite having large number of driving schools in Nigeria, most of the schools do not possess what is needed as a minimum requirement to be driving school.

Federal Road Safety Corps in its Driving School Standardization Programme (DSSP) made it clear that the minimum requirements for registration and certification of driving schools include that the school must have classroom and administrative offices, roadworthy vehicles for driving instruction (dual control), licensed driving instructors, course manual, highway code, traffic laws/regulations, first aid facilities, fire extinguishers, open space/driving range, road sign models, visual and audio-visual instructional aids. Other requirements are simulators (mock vehicle), vision acuity test facilities, library and inspection pits/workshop. Fulfilling these requirements may be difficult to most of driving school proprietors, but not to tertiary institutions offering ATE as a course. A very good example is Federal College of Education (Technical) FCET Potiskum. The college has all what is required by DSSP, this gave the school opportunity to run a driving school and award driving certificate. It is because of this advantage FCET Potiskum driving school is incomparable with all the 9 FRSC accredited driving schools in Yobe state.

### **Conclusion**

For many years, road safety education has acquired a substantially important role in public health strategies aimed at strengthening the integrity and welfare of the entire population all over the world. According to the functional paradigm of RSE, the prevention of risky conduct on the road which resulted in high number of traffic crashes may be reduced through the development of positive attitudes and perceptions, and accurate knowledge of traffic norms and safe behavior. This could only be achieved by fully integrating RSE into ATE and other relevant course's curriculum.

### **Recommendations**

Based on the above discussions, it is recommended that:

1. Relevant stakeholders should in a matter of urgency to fully incorporate RSE into the ATE curriculum at both NCE and B.Tech. Ed. levels.
2. FRSC and other relevant bodies should add more value to post-license driver training in order to keep this drivers updated.
3. FRSC should extend their awareness campaign from secondary school down to children in nursery and play class as is being done in some developed countries.
4. There need for more non-governmental organizations involvement into the matter concerning RSE in Nigeria.
5. All tertiary institutions offering ATE and fulfill the DSSP criteria should run driving school and award certificates in order for more good hands to come in.



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