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School of Transportation Sciences

Master of Transportation Sciences

Master's thesis

Adoption of E-Learning for PBD in Tanzania

Marwa Chacha

Thesis presented in fulfillment of the requirements for the degree of Master of Transportation Sciences, specialization Traffic Safety

SUPERVISOR :
Prof. dr. Gerhard WETS

CO-SUPERVISOR :
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2020
2021

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Supervisor:

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2020/2021

Preface

This thesis partially fulfils the master study program “Master of Transportation Sciences in Traffic Safety” at Hasselt University. The research originated from my passion for developing an eLearning method of bus driver training in Tanzania. As the world moves further into the digital age, generating enormous opportunities for training in transport sectors to improve road safety, fuel economy and Health. My background in Automobile engineering and work experience at a government transportation agency in Tanzania has motivated me to select eLearning in Tanzania. I am highly interested in developing online training to help reduce traffic crash and injuries caused by human error. The bus drivers in Dar es Salaam were the target group in this study.

I would like to express my appreciation to my supervisor and promoter, Pro. Dr Geert WETS and co-supervisor Dr Ariane Cuenen in the Institute of Transportation Sciences, Hasselt, encouraged constructive advice to improve my thesis report. Also, I would like to thank my wife, family, and friends who had been the source of my motivation throughout my master's study of this thesis.

Summary

The increasing popularity of eLearning does not refer to a specific educational method of instruction nor practice of delivery. Only the design could bring differences depending on the sophistication of the educational process employed, the resources made available, and the skills. Tanzania has higher access to the internet on mobile phone devices and computers, especially in a city like Dar es Salaam, Mwanza, Dodoma, and Arusha. It provides access to solving traffic safety issues in major cities and reduce the high rate of crashes that causes severe injuries and fatalities. Dar es Salaam is a leading city. According to the Tanzania Traffic Police (2019), the report (2016 -2019) showed that the buses traffic crashes caused injuries and death (ie l23153 and 10,334) respectively in Tanzania. Although the number of accidents injuries and death per year is still higher than in developed countries, there is a slight improvement of accident compared to last decades.

The study focused on bus driver's training to improve road safety, and fuel economy needs in the fleet organisation of Tanzania. Previous research has shown that traffic crashes caused by poor driving issues such as driving scenarios misjudgements, excessive speed, and overtaking errors. In addition to that, some accidents are fuelled by negligent of pedestrians, cyclists and cart pushers, alcohol, and drugs consumption (Walter et al., 2018). This occurred due to low skill and knowledge about traffic safety and driving behaviours (higher speed, drivers while drinking and use mobiles, and fatigue).

The improvement of road safety and fuel economy is highly needed in the fleet organisation in Tanzania. It will increase the fleet organisation productivity and reduce the rate of accidents. Many studies suggested that bus driver's training at different levels is necessary to improve skill and knowledge (IDREAMS 2020, ESTC,2010&2017). Digital technology is a critical means of developing the intervention for bus drivers based on developing software tools such as eLearning, coaching tool. The professional bus driver's training programs will contribute positively to how driving is done by various drivers in Tanzania.

The literature review, semi-structured interviews and questioners were used to investigate the factor which leads to the adoption of eLearning in Tanzania. The study's developed contents for eLearning resulted from questioners for periodic training of professional drivers in Tanzania. The author designed the eLearning application for bus driver's training through a trial version of I spring soft, which has all the required features. The required experimental research proposed by the trainers interviewed as a control group to investigate the impact of using eLearning study compared to classroom studies.

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ABBREVIATION:

COMESA: Common Market for Eastern and Southern Africa
Driver CPC training: Driver Certificate in Professional Competence
DSM: Dar Es Salaam
EAC: East African Community
HGV: Heavy Goods Vehicles
LATRA: Land Transport Regulatory Authority
NIT: National Institute of Transport
VETA: Vocational Educational and Training Authority
PBDT: Professional Bus Driving Training
PSV: Passenger Service Vehicles
SADC: Southern African Development Community
TCRA: Tanzania Communication Regulatory Authority
UWAMATA: The Driver
WHO: World Health Organization

CHAPTER 1 INTRODUCTION AND NEED FOR THE STUDY:

1.0 Introduction:

Professional Driver training is one of the predominant interventions that can recover the tarnished reputation of the transport sector. Which is currently a high-risk industry due to the number of buses and trucks causing carnage globally. The World Health Organisation (WHO) published a report in 2017 in which it estimated 85-90 percent of accidents are from commercial vehicles due to human errors. Most (91%) of the world's fatalities on the roads occur in low-income and middle-income countries, which is only 48% of the world's registered vehicles. The traffic crash in Tanzania proportionate to the number of cars on the road is 20 to 30 times higher than in the USA and many countries in Western Europe. Due to the shortage of skills, many transport operators take the credentials presented by recruits at face value without adequate skills verification (Museru LM et al., 2015).

In Tanzania, as at 2015, the national driver's training program was designed by the National Institute of Transport (NIT) for both the passenger and heavy goods vehicles (truck) with the cooperation of Transaid from Europe. The bus driving lessons averagely last between two and five weeks at NIT and Vocational Educational and Training Authority (VETA). They had a high student intake, with some reportedly having eighty students per course (SUMMATRA, 2017).

The scope of this study is to examine the professional bus driver's eLearning training program in Tanzania. The first step was reviewing the current curriculum for initial qualified passenger vehicle in Tanzania and compare it with the initial and periodic training program from Europe. The common terminology used in the study has defined below. This section consists of subtitles: problem statement, followed by the study's research objectives and research questions, the scope of the study area and justification of the study.

Definition of Key terms:

- **Adoption**: the process of starting to use a new method, system, law, etc. More than 60% conducted independent trials with one or more technologies, with 50% of these trials resulting in permanent adoptions.
- **Professional Bus Operator/drivers**: A bus driver is qualified to drive a bus and work for private clients, transportation services, and schools. Their primary responsibility is to follow an allocated route and pick up passengers along that route. There are various bus drivers from urban transit, Intercity, Tour and charter, School bus, streetcar operators and subway train operators (The Motor Carrier Passenger Council of Canada (2011).
- **E-Learning**: The process of providing courses on the internet or an intranet. The eLearning systems such as Blackboard, Moodle, WebCT, and Desire2Learn are web-based software used for managing course delivery over the Internet (Bervell & Umar, 2018; Zheng, Wang, Doll, Deng, & Williams, 2018).

1.1 Background Study:

Tanzania is a developing low middle-income country situated in the East of Africa along the Indian Ocean, sharing borders with Kenya, Mozambique, Burundi, Rwanda, Uganda, DR Congo, Zambia, and Malawi. Tanzania occupied 947,303 km2, where DSM covers only 0.16% of the mainland area (PMO-RALG, 2014). Following an official census of 2012, Tanzania had 44.9 million inhabitants, with an estimated population increase of up to 55.9 million inhabitants in 2019. The distribution of the population shows that most Tanzanians (96%) are relatively young (<65 years old) (Tanzania National Bureau of Statistics, 2012). According to the World Bank, the rate of urbanisation in Tanzania is overgrowing; by 2050, half of the Tanzanians will be living in urban areas WB, 2019). The report also

indicates DSM as the fastest growing city in Tanzania and the third fastest-growing city in Africa. DSM grew at an average rate of 5.8 per cent annually from 2002-2012. In addition, DSM accounts for an estimated 40 per cent of the urban population for about 10 million, becoming a megacity by 2030 in Tanzania.

Moreover, Infrastructure investment and telecoms services continue to support the growth in Tanzania. A dramatic improvement of information and communication technologies (ICT) infrastructure with internet subscription by the technology of fixed wireless, mobile wireless and declined fixed-wired. The internet users in Tanzania rose by 16 per cent in 2017 to 23 million, while mobile penetration has increased to 80% by 2017 (TCRA, (2017). It will support the usage of tools for eLearning professional driver training as shown in figure 2 below the trends of mobile dominates Internet Market in Tanzania.

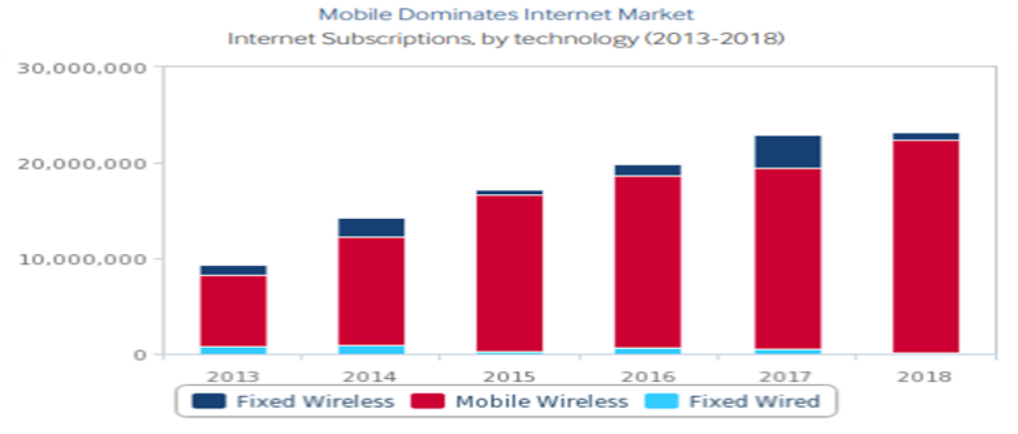


Figure 1 : source: TCRA, operators, Fitch Solutions

Furthermore, Road transport is the most widely used form of transport in Tanzania, carrying over 90% of the passengers and 75% of the freight traffic in the country. On the other hand, buses are the most popular and cheapest means of getting around Tanzania and operate between all major towns (Museru et al., 2002, p.24).

Long-distance buses also run between Tanzania's major cities, rural areas, and main Centres of neighbouring countries, including Nairobi and Mombasa in Kenya, Kampala in Uganda, and Kigali in Rwanda and Lilongwe in Malawi. (C.G. Prato & S. Kaplan, 2014). The overall condition of the rail network is relatively poor, with tremendous implications in terms of inefficient and unreliable services, and the dominant mode of transport in Tanzania is road transport (Wood, 2004). It has approximately 87,600 kilometres of public roads across an area almost as large as France and Germany combined, although most of them are in poor safety condition. The upgraded road has increased the number of long travel distance trips which also influenced passenger vehicle crashes due to many factors such as speeding, Faulty vehicles, unsafe overtaking and drivers' tiredness and stress (SUMATRA, 2017).

The previous study stated that the majority of commercial vehicle accidents caused by driver error are due to the passenger vehicle driver (81%) and Trucker (22%) worldwide (Jessica Whitehouse, 2017). Also, the Tanzanian Police Crime and Traffic Incidents Statistics Report of January to December 2016 indicate that most crashes are due to human factors (81.1% of all crashes), while those associated with defective motors vehicles accounted for 8.9% and environmental factors 10.0%. Low skill level (Mc Gwin & Brown, 1999), inexperience (Mc Cartt et al., 2003), risk behaviours (Rolison et al., 2014) and non-professional commercial drivers have the highest risk to get traffic crashes (Husnain. M, 2011). Driver training is a necessary and essential aspect of vehicle operation and general mobility to reduce traffic crash injuries and fatalities. Well organised programs for commercial vehicles with paradigms and methodologies can lead to achieving the target. Figure 2 describes driver training programs to increase driver safety and driver skill by general and situational methods.

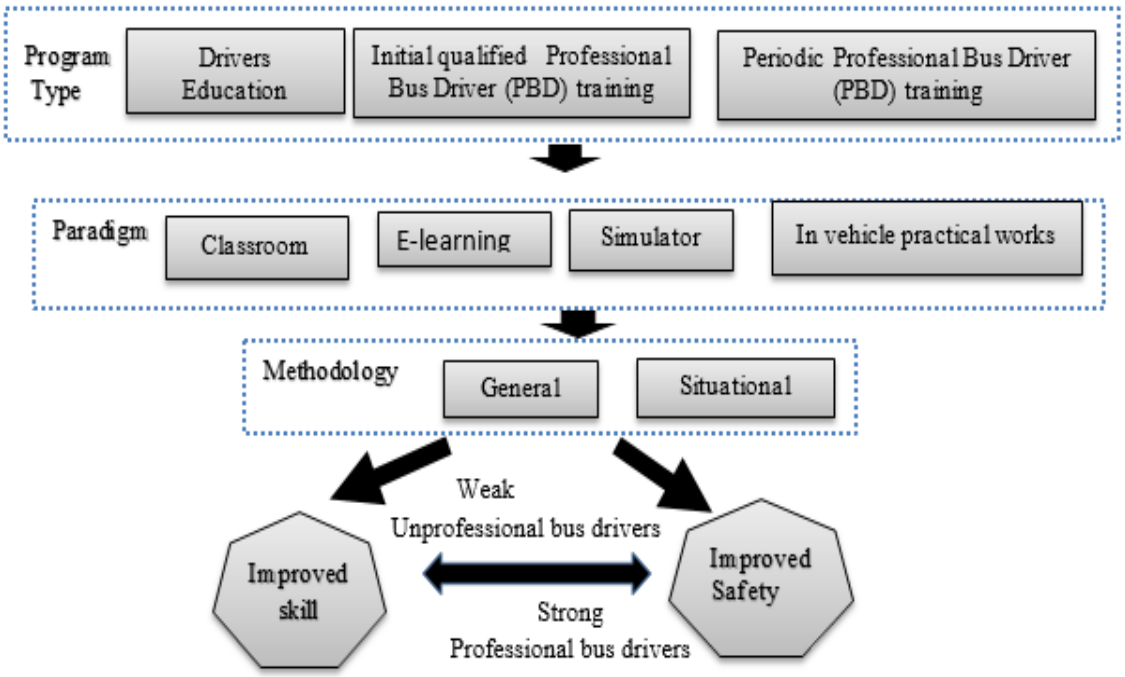


Figure 2: Program designed for various structures of PBDT program.

A brief explanation of the above professional bus driver training programme PBDT implemented in Tanzania. Each of these programs may feature one or more paradigms (classroom, simulator/simulation, eLearning, and in-vehicle practical fleet works which can separate into either general or situational training. Unprofessional PSV drivers must take initial qualified training professional bus drivers' program, which usually includes more general instruction as the drivers are inexperienced and their knowledge and skills are limited. The professional drivers must have situational training that focuses on specific sets of skills or knowledge; a national driver-training program created for PSV drivers based on traffic safety legislation of Tanzania. In January 2020, the Land Transport Regulatory Authority (LATRA) published Government Notice No. 81 of Certification of Commercial Vehicle Drivers and Registration of Crew) Regulations. Thus, bringing professional commercial vehicles includes bus driver training of initial qualification, and periodic is mandatory for all commercial drivers in Tanzania.

1.2 Research Study Area:

Dar es Salaam is Tanzania's most prominent and fastest-growing city, with 4.4 million people in 2012 (NBS 2014). The nation's economic hub and principal port have a GDP per capita (US$3000 in 2012 at PPP), which is 1.7 times higher than the rest of the nation (ESRF 2015). Its location is in the eastern part of the Tanzanian mainland at 6o 51'S latitude and 39o 18'E longitude. With an area of 1,350 square kilometres (km2), it occupies 0.19 per cent of the Tanzanian mainland, stretching about 100 km between the Mpiji River to the north and beyond the Mzinga River in the south. The Indian Ocean borders it to the East (PMO-RALG, 2014). According to Mkalawa and Haixiao (2014), public transit accounts for 68% of passenger trips, walking 17%, and private vehicles 12%. The regional bus terminal in Dar es salam found in Ubongo district has been described as the busiest transportation hub in East and Central Africa, hosting between 300 and 350 passenger's buses a day (Sebastian.M (2010)

Figure 3: Regional Dar es Salaam @2013 CALIPER.

In Dar es Salaam, the smartphone penetration rate is likely higher than the national average, given the city's relatively higher levels of income and lower rates of poverty. Nonetheless, various indicators of the "smartphone divide" prevail, with ownership rates nearly twice as high for men, for younger adults (18–34 versus 35+)) and for higher-income individuals (Poushter 2016).

1.3 The Commercial Bus Traffic Crash Trend in Tanzania:

In Tanzania, the majority (>90%) of bus crashes source is the human factor, including 'reckless driving' and 'vehicle negligence' (Make Roads Safe, 2010). Poor driving issues such as Misjudgement, Excessive speed, Overtaking errors, Negligent, pedestrians, passengers, cyclists and cart pushers, Alcohol and drugs consumption, Reckless driving, Overloading of passengers and goods, Parking errors and Driver fatigue are among human factor causes of accidents (Walter et al., 2018). Between 2010 and 2012, 3,381 persons lost their lives in bus crashes in Tanzania. The study done by Palfreman & Joshua (2014) reviewed that 71.23% of bus crashes that took place between 2010 and 2012 reportedly occurred due to reckless driving, including: 'driver intoxication' (29.62%) and 'speeding' (41.97%). An additional 24.62% of bus crashes reportedly occurred due to 'tyre bursts' (17.65%) and 'engine fires' (6.97%), suggesting driver and bus operator negligence to the maintenance requirements of the vehicles they were operating. Only 4.15% of bus crashes reportedly occurred due to external factors that included bad weather 'and 'uneven road surfaces. This finding was consistent with bus passengers' perceptions on why bus crashes occur in Tanzania. Twenty-nine separate bus crashes that occurred between 2009 and 2012 presents that only a (<10%) percentage of crashes are due to environmental factors (i.e. Weather, road conditions).

1.4 Problem Statement:

The factors presented above describe the issue and challenge of road safety in Tanzania. Driver training in the country is undertaken mainly with privately owned schools without approved harmonised national curricula, certification of the trainers, and control of assessing procedures; the driver training lacks the structured authority that controls the qualification of a trainer and a trainee. Only VETA and NIT are accredited institute for bus driver training programs. Training programs from VETA do not have proper control on how to examine their skills and attitudes before trainees obtain certification for competence and use it to get vehicle driving license class D or E (Walter et al., 2018). The previous

research study revealed an acute shortage of professionally trained and qualified commercial vehicle drivers in the East Africa region. Only about 38% of transport operators have ever undergone a professional course in transport since they were employed (EAC 2012). The limited training school for experienced drivers with traditional training method of mixed form with off-road and on-road driving and cover exercises on rules, signs, and technical aspects of the vehicle, accident causes and the legal and safety responsibilities of the driver. Classroom teaching is a method used to prepare the driver for the practical elements of the learning program as a traditional method.

Currently, NIT is the only training institute accredited for professional drivers for commercial vehicles (heavy-duty truck and buses) since 2015, initiated by Transaid. To increase the rate of bus professional driver's candidates, the use of modern training tools is necessary for professional drivers in Tanzania through available technologies to reduce road accidents. That is why this thesis seeks to adopt an E-learning method for professional bus drivers by using available tools such as smartphones, tablets and computers. Furthermore, the research study aims to increase driver's awareness of health, well-being, lifestyle, attitude, and knowledge to improve road safety.

1.5 Research Objective and Questions:

1.5.1 The main objective of the study:

The study's main objective is to provide a professional driving training program for bus drivers in Tanzania through E-learning. This programme will increase the knowledge and skill-based safety system approach and achieve its goal by reducing serious injuries and fatalities to road users.

1.5.2 Specific objectives:

The study will seek to examine:

i. Raise road safety awareness for the bus driver in Tanzania.
ii. Maintain and enhance the professionalism of bus drivers by continuously updating their skills.
iii. To implement E-Learning for the professional driver training programme in Tanzania.

1.5.3 Research Questions:

The main research question is how to develop a driving safety training programme for bus drivers in Tanzania using the e-learning tool?

i. What are the existing, National and Its comparison to the International structured curriculum, bus driver training programmes?
ii. Which devices will be effective in developing the e-learning tool regarding the national cultures?
iii. How is the bus driver stakeholder's response to the e-learning implementation?
iv. How will the E-Learning driver training programme reduce the risk of a vehicle crash in Tanzania?

1.6 Research Framework:

1.6.1 Scope

- The study relied primarily on data collected from driving schools in the Dar es Salaam Region willing to participate in the study.
- Professional bus drivers' age between 25 to 55 year old.
- Focus on adopting and implementing an e-learning platform for professional bus drivers collected through an online questionnaire and semi-structured interviews.

1.7 Justification of Study:

Bus drivers are effectively peripatetic workers, who work long-distance like in Integrations, outside of countries. The road network in Tanzania in 2004 consisted of about 80 000 km of roads, with the area of the country being 884 000 square kilometres. Professional training is now mandatory for all

commercial vehicles according to the LATRA regulation of 2020. The challenge remains how will provide bus driver training regarding their working schedules. Recognising the central role of the drivers have a significant impact on the passengers' travel experience. We set out to investigate how bus drivers will get training and equipped to take in this broader customer service role. The eLearning could provide a beneficial learning course for some drive training courses before attending the on-compass course for practical and sitting exams. The advantage of eLearning will encourage even supervisory and managerial grades of staff to have training that will boost customer service delivery and improve traffic safety. There is no specific research related to e-Learning adoption of the professional bus driver in the Tanzanian driving school learning environment; hence this research will provide an analytical foundation for all stakeholders concerned as follows:

To practitioners: This research will provide a foundation for implementing e-Learning integration in the driver training system during actual implementation to ensure success in the process. Implementers, in this case, include NIT professionals and VETA, organisation planners such as managers, and the users of such systems, which at large are the citizens of Tanzania.

To academicians: This research will add to the general understanding of eLearning implementation in the Tanzanian environment. Also, the research work will provide helpful knowledge to academicians for the development of models for e-Learning implementation for Tanzanian driving schools. Moreover, the research results will open up new ideas for further research to enhance e-Learning practices in the Tanzanian context of professional bus drivers.

To Policy Makers: The research' results will shed some light on the improvement of the current National ICT policy to take on broad policy statements to guide and support the move towards e-Learning based on the analytical fact.

CHAPTER 2 LITERATURE REVIEW:

2.1 Theoretical Literature Review:

Training is a process of assisting employees to acquire or develop knowledge, skills, techniques, attitudes, and experiences that enable them to make the most practical contributions to their combined efforts to meet organisational objectives (Chruden and Shermun (1976). The rapid changes in technology have created a knowledge gap which increased the importance of training. In addition, the social-economic advancement and individual needs have investigated the training of the workforce in organisations. Thus, it has added more significance and implications on training activities than before. These training activities have also gained special recognition as organisations activities are growing, hence expanding the knowledge requirement.

Armstrong (2006) refers to training as the systematic development of an individual's knowledge skills and attitudes to perform a given task adequately on the job. The training involves learning of various kinds and in multiple situations. Learning may be something that the trainee wants to do for himself/herself, or it may be necessary to provide it for him/her. According to Kelly (2011), training will be practical only when certain conditions are meeting: First, Buy-in from the top; without a commitment from top management, training will be nothing more than a charade. Second, all company layers must believe that training is a process and not a singular learning event. Third, training consumes both organisation's time and money; therefore, it is crucial to determine how well it is conducted (i.e. trainees feedback).

2.2 Overview PBDT in African Corridors, Tanzania:

The scope of the study included a comprehensive literature review complemented by a survey of selected bus drivers, the Land Transport Regulatory Authority (LATRA), and public and private driving schools. The information sought in the literature review and survey aimed to identify and examine (1) similarities and differences in training strategies among existing driver training programmes in Tanzania and the European Union, (2) similarities and differences in the curricula applied in selected training programmes in Tanzania and European Union, and (3) How E-learning used to enhance the effectiveness of professional bus driver training programmes.

2.2.1 Overview professional commercial driver in African Corridors, Tanzania:

The Land Transport Regulatory Authority (LATRA) monitors transportation safety in Tanzania, including providing a professional driving permit. According to the regulation of LATRA made under section 45 (ACT NO 3 OF 2019) requires a driver of a commercial vehicle to cross the border under Tripartite Agreements among COMESA, SADC and EAC countries. "Tripartite agreement" means agreements entered between EAC, SADC and COMESA. "Regional agreements" includes a contract entered between the United Republic of Tanzania and member states of the East African Community (EAC), Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) blocks and Tripartite Agreements. The Authority described the requires that the professional commercial driver (bus and trucks) possesses a valid driving licence in compliance with the vehicle categories and regional standards; or complies with the requirements of regional and tripartite agreements.

Moreover, a bus driver who intends to be certified by the Authority should apply to the Authority prescribed in the Second Schedule. The application procedure includes a certified copy of the essential training certificate in driving a commercial vehicle from a recognised driving institution and a certified copy of the driving licence. Then the proof of payment of certification fees; and a recent medical examination report from a recognised medical practitioner as prescribed in the First Schedule. A certificate of authorisation shall renew every three years with proof of completing refresher training at a recognised institution (ACT NO 3 OF 2019).

2.2.2 Implementation of Professional bus driver training in EAC:

The implementation of professional bus training in East Africa occurred due to the high rate of accidents in past decades within interregional countries. Research studies have revealed an acute shortage of professionally trained and qualified commercial vehicle drivers in the East Africa region. Only about 38% of transport operators have ever undergone a professional course in transport since they were employed (EAC 2012. Chia Wei (2014) states that bus drivers occupy long working hours, irregular schedules, and lack of scheduled time for breaks and meals, which increases the risk for traffic crashes to occur frequently. EAC, the standardised curriculum of commercial vehicles (bus and trucks) Tanzania, is adopted in NIT driver training programme as Passenger Service Vehicle (PSV) for busses, Heavy duties Driver course for trucks, Vehicle Inspection and Driver Examination Course since 2015. Press release transaid (2020) reported that the professional driver training after established PCV curriculum, only six NIT driver trainers trained for the initial qualification training course in 2016. The focusing was on teaching practical driving techniques and road safety skills to those trainers with HGVs (IVECO Stralis) and passenger buses at NIT. The project expanded to other East Africa countries like Kenya and Uganda. In Uganda, 12 trainers trained with the EAC Standardised Curriculum, of whom 3 or 4 trained as Master Trainers in 2018. The project implemented by GIZ E4D/SOGA – Employment and Skills for Eastern Africa, Safe Way Right Way and Transaid with support from industry partners and partnership with the Ugandan Government. It funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), the UK Department for International Development (DFID) and the Norwegian Agency for Development Cooperation (NORAD).

2.2.3 Professional commercial driver curriculum for EAC, Tanzania:

The East African Community (EAC) standardised driver training curriculum and instructor's manual for drivers of large commercial vehicles designed as competency-based; it includes the specification of training modules discerning practical and theoretical training hours. The entrance requirements include experience for an excellent old driving license class E or C with not less than thirty (30) years of age. Also, valid new driving license class C2 and having worked with it for at least three (03) years and age not less than thirty (30) years (Transaid,2015). The current curriculum for professional bus drivers in Classroom-based theory modules includes; Driving Philosophy, Drivers' Welfare & Fitness to Drive, Traffic laws, rules, regulations and other relevant laws, Road signs, signals & markings, Basic Mechanical Principles, Defensive driving, HIV/AIDS awareness, Customer Care, Managing Incidents, First Aid, Transport Documentation, Environment & Transport and Carrying a Load. While on-vehicle based practical modules have Basics of Driving, Reversing, Negotiating the road safely and Vehicle Checks PSV (Transiad, 2015). According to the literature review of the standardised curriculum of Kenya and Tanzania has adopted curriculum of East Africa with the same contents, teaching method and assessment of professional commercial drivers but differed term of training hours as shown below.

Table 1. Summary of Training and assessment hour of PBD curriculum

Country	Training education hours		Assessment hour		Total hours
	Theory	Practical	Theory	Practical	
Tanzania (EAC)	28	46	3	0.5	77.5
Kenya	55.5	51.5	2	0.5	109.5
Uganda	61	96	3	0.5	160

Source: Trademark East Africa & Transiad (2015) and National Transport and Safety Authority (2016)

2.2.4 Trainee Evaluation Professional bus driver in Tanzania

According to transiad (2015), an Instructors' Reference Manual developed to complement the curriculum of EAC. It is aimed primarily as a training aid, a tool for instructors to help ensure quality and to provide essential training material to be shared with drivers during the training. In addition to that, the assessment conducted by the authorised driving school through practical and theory exams. The table shows the summary trainee evaluation for the professional driver training programme adopted from the East African Community Standardized Curriculum for Drivers of Large Commercial Vehicles (Passengers).

Table 2. Summary of trainee evaluation

Major areas of assessment	**Assessment Methods**	**Assessment Instruments**	**Assessment Criteria**
• Curriculum Outcomes • Learning resources • Learning activities • Practical driving skills	• Written examination • Oral examination • Practical driving	• Training vehicle • Examination question papers • Examination answers papers • Driving Assessment form	**Theory Pass Criteria** • One hundred questions of a mixture of multiple-choice. Written answer for three hours with a minimum score of 70%. **Final Practical Driving Test** • Meet the requirements

Source: Trademark East Africa & Transiad (2015)

The number of driving licenses issued within Tanzania is a very high workload for the police, and anecdotal evidence suggests that they rush candidates through the test to finish on time. Driving tests usually be arranged within a few days by the appointment of the traffic police. The lack of a structured practical driver training programme includes elements associated with an awareness of potential or actual danger and ways of avoiding it (SUMATRA, 2017).

2.2.5 The impact of professional commercial driver training in Tanzania:

The evidence-based reviewed that the professional commercial drivers' programme and enforcement of the law have reduced the accident rate from 2016 to 2020 compared to 2010 to 2015. On August 13, 2020, the author of the Citizen reported an exclusive interview with Police Inspector General said that the number of road accidents had drastically decreased from 91,908 in the period 2011-2015 to 24,339 in 2016-2020: equivalent to a 73.5 per cent decrease in five years. "Also during 2010-2014 the deaths were 19,294 while in 2015-2019 the deaths decreased by 12,533 equivalent to 35 per cent," Muslim said. In another measure, Commander Muslims has said road safety offences have decreased by 18 per cent, from 2,694,237 violations in 2018 to 2,208,928 offences. The achievements resulted from "technical strategies by the Police Force, enforcement of the laws and public awareness regarding crime and road safety". In addition, the professional bus drivers training programme improved positive behaviours such as wearing a safety belt and limitation of night driving.

2.3 Overview professional commercial driver in European Union:

The Driver Certificate of Professional Competence (Driver CPC) is a qualification for professional bus, coach and lorry drivers. It has been introduced across Europe to improve road safety and maintain high driving standards (Wikipedia, 2020). In Europe, driver education covers many different ways to enhance driving skills and safety on the road. Research studies of PRAISE described how professional

driving schools offer driver education based on the GDE matrix (Goals for Driver Education) (ETSC, (2010). The Directive established requires initial qualification and periodic training requirements for drivers as a mandatory aspect to commercial vehicles bus and Lorries in the European Union. The training organised by training centres approved by the Member States. The testing of initial qualification, when applied, is managed by a dedicated entity under the supervision of competent authorities in the member states under Directive 2003/59/EC.

The purpose of the Directive is to raise the standard of new drivers and enhance the professionalism of existing truck and bus drivers throughout the EU through a continuous update of their capacities. Raising the level of qualification of drivers is seen as an essential element in increasing road safety. The training foreseen by the Directive aims specifically at increasing drivers' awareness of the risks and the ways to reduce them. The general objective of the Directive translated into four specific goals: Ensuring free movement of drivers within the EU road transport sector. Defining standards of professional competence and raising the consideration of the profession. Improving road safety and safety of drivers and Setting a level playing field for drivers employed by an undertaking in the EU (Panteia, 2014)

2.3.1 The curriculum of the professional (bus & lorry) driver training in EU:

According to Directive 2003/59/EC, an amendment of the Professional Driver Training (trucks and buses) Directive, 2006/126/EC described periodic training of drivers for large goods vehicles (LGVs) above 7.5 tonnes and passengers by an approved training centre. Moreover, they developed an electronic platform, considering cost-benefit analysis by the Commission, including the option of expanding the EU driving license network set up under Directive 2006/126/EC. Based on the CPC certifying an initial qualification and the CPC is certifying periodic Training, Member States' competent authorities shall, taking into account then provisions of Article 5(2) and (3) of this Directive and Article 8 of this directive, mark the harmonised Union code, '95'. Drivers who have acquired rights receive their DQC when they have completed their first 35 hours of periodic training. Their DQC is valid until 9 September 2018 for PCV drivers and until 9 September 2019 for LGV drivers.

Furthermore, article 7 describes periodic training that shall consist of training to enable holders of a CPC to update the knowledge essential for their work, with specific emphasis on road safety, health and safety at work, and reducing the environmental impact of driving. Subjects relating to road safety strengthened in the training courses, such as hazard perception; the protection of vulnerable road users, pedestrians, cyclists and persons with limited mobility; fuel-efficient driving; driving in extreme weather conditions and carrying abnormal loads. European members agreed to provide a clear option to improve and modernise training practices using information and communication technology (ICT) tools, such as e-learning and blended learning, for part of the training while ensuring the quality of the driver training. The training subjects should consider developments in the relevant legislation and technology and shall, as far as possible, take into account the specific training needs of the driver. Some Member States have added minimum requirements for the inclusion of eco-driving. Finland, for example, requires at least seven hours on safety and eco-driving, and Belgium requires at least one module of three hours of practical lessons on rational and eco-driving included in the programme (consortium questionnaire (2014).

2.3.2 Evaluation for implementation of the PBDT:

In Europe, many research pieces carried out to evaluate the effects on accidents of requirements for drivers, basic driver training and professional driver training like ETF, IRU (2013), CIECA (2014), ETSC PIN Flash No24 and ex-post evaluation. Ex-post evaluation study on the effectiveness and improvement of the EU legislative framework on the training of professional drivers, done by Panteia in October 2014. Also, the Report implementation of Directive 2003/59/EC (COM (2012) 385 final) described an overview of the current state of play in terms of performance and highlighted some of the problems identified. Apart from that, SWD (2017) conducted an impact assessment by an external

consultant in close cooperation with Commission services. The table below shows stakeholder's comments and feedbacks toward the professional driver training programme in European Union.

Table 3: Description of the stakeholders

Stakeholder		**Description of Stakeholder group in 2014**	**Key Interests**	**Main expected Impact of preferred policy option**
Road transport companies	The business providing International and domestics road freight and passengers transportation services	In 2014 there were circa 592.000 enterprises active in freight-related road transport and 336,000enterprises in passenger-related road transport. Between 65% and 95% of transportation enterprises represent SMEs.	They maintain profitability and employment, legal certainty and a fair and level playing field for intra-EU competition; well-qualified workforce.	Reducing cost in cross border regions of the MS concerned by mutual recognition Increased labour supply in the MS concerned with a minimum age Increased clarity provides more predictability and a level playing field
Professional drivers	The human resource of road transport companies	In 2014 in EU 28, there were 3.3 million HGV and 0.9 bus drivers out of which by the Directivecovered respectively 2,8 and 0,8 million drivers	Health safety in the workplace, free movement, high-quality training and professional career opportunities, good chances of employability.	Full mutual recognition of periodic training, access to the profession at a lower age in concerned MS. A training content that further improves road safety and fuel efficiency Increased clarity provides more predictability and a level playing field Access to the profession at an earlier age in concerned MS

Source: SWD (2017)

Moreover, participants have emphasised the importance of ongoing EU action in professional drivers' qualification and training. At the meeting of the CPC committee on 23 October 2014, the last part of the meeting dedicated to an informal discussion with the Member States on how to improve mutual recognition. The CPC committee met again on 9 October 2015, when the ongoing review of the Directive discussed. Regarding the problem with mutual recognition of periodic training, the participants expressed concern about the Member States applying different practices and generally saw a harmonised approach. There was an exchange of views on mutual recognition of periodic training in another Member State and the content and structure of the driver training. The underlined technological process importance and the need for additional clarity on some aspects, such as e-learning, keep Directive up to date (Panteia, 2014).

2.3.3 E-learning for initial qualification and periodic training in Europe:

E-learning is allowed during initial qualification in Estonia and Hungary. Also, in periodic professional driver training, e-learning is allowed in Austria, Estonia, Hungary, the Netherlands and Sweden. So far, only one training centre approved that provides, in part, e-learning hours. In Estonia, e-learning is allowed in the optional subject of working environment and traffic safety. In the Netherlands, e-learning is permitted, but not more than 4.5 hours per training day. The advantages could also apply to CPC training as lowering costs and increasing the harmonisation of training material are two concerns mentioned in the public consultation and the consortium questionnaire. However, there are also disadvantages to e-learning. This technique is not equally effective for all users, and it requires computer skills that not everyone may have. Furthermore, learning may seem more suitable for younger generations who are familiar with digital technology. Additionally, e-learning targets cognitive learning outcome and is better suited to develop knowledge than practical skills (which would be required drivers).

The initiative of e-learning received support from the respondents; 60% considered it a valuable contribution to the training, while 35% disagreed. Positive elements of e-learning mentioned in the public consultation are that the system would facilitate highly theoretical contents. Moreover, it has a greater flexibility level than classroom-based learning (for example, allowing candidates to incorporate their mandatory hours into a personal package that suits them and their work schedule) while reducing training costs (Panteia, 2014).

2.3.4 Challenge raised during Implementation of the BPD in Europe:

The author Ariane Debyser (2018) state that despite the overall positive impact on the BPD in Europe, the ex-post evaluation identified a series of shortcomings relating to the directive. Firstly, Difficulties for drivers to obtain recognition of training undertaken in another Member State. Secondly, training content only partially relevant to drivers' needs. Thirdly, difficulties and legal uncertainties regarding the interpretation of exemptions. Last but not least, inconsistencies between Directive 2003/59/EC and Directive 2006/126/EC when it comes to the minimum age requirements, ambiguity concerning the possibility to combine Training under Directive 2003/59/EC with training courses required under other pieces of EU legislation (i.e. hazardous goods (ADR), passenger rights and animal welfare training), and lack of clarity concerning the use of ICT for training courses such as e-learning or blended learning (COM/2017/047 final - 2017/015 (COD).

Moreover, the difficulties in terms of mutual recognition stem from the fact that national authorities can indicate code 95 (confirming they obtained a certificate of competence) either on the driving licence or on a separate driver qualification card (DQC). The directive prescribes the mutual recognition of code 95 but not of the training or the CPC. The implication is that, in the eight Member States which have chosen only to indicate code 95 on driving licences and not to issue DQCs (namely Germany, Greece, Latvia, Lithuania, Malta, the Netherlands, Austria and Poland). Also, the authorities are unable to provide the mutually recognised code 95 for a resident in another Member State who has followed periodic training on their territory. This situation derives from the fact that only the Member State where the driver resides is entitled to issue a driving licence (Ariane D.2018).

The modules have considered being part of the challenge. The list covers the knowledge and practical competence ranging from technical aspects of vehicles to road and environmental safety and logistics. Stakeholder consultation suggests a need to improve the content of the existing professional driver syllabus. The 'minimum requirements on the subjects listed are not sufficiently related to the core competencies needed and are not sufficiently underpinning important aspects such as driver recognition and fuel-efficient driving'.

Furthermore, when it comes to periodic training, enshrined in Article 7, Member States have broad flexibility. The impact assessment concludes that 'it did not ensure the training covers topics related to the core objectives such as road safety and does not only repeat the same driver training (ETSC, 2017).

2.3.5 The resolution of the challenge for BPDs training programme in EU:

The best practices conducted by the Member of Parliament of European union after received ex-post evaluation study by Panteia et al. (2014) with an independent and unbiased evaluation of Directive 2003/59/EC, its impacts on road safety and the economic, social and environmental effects. The made following area in the article7, ten and Union code 95. Article 7 of Directive 2003/59/EC on periodic training amended to ensure that the regular bus driver training covers at least one subject on road safety and that the same subjects not repeated within the same driver training. The objective is also to ensure that the driver training is relevant for the work carried out by the driver and reflects developments in applicable legislation and technology (Ariane D.2018).

Article 10 on a Union code modified to include a reference to the harmonised European. Union code 95, and ascertain that all CPC holders issued with the mutually recognised. The focus on fuel-efficient driving behaviour reinforces safe driving; includes references to the use of automatic transmission

systems and the transport of dangerous goods, animal transport, and disability awareness. The other amendment enables Member States to use ICT tools in training covered by the directive with other forms of training mandated by EU legislation.

2.4 Comparison BPDs curriculum of Tanzania and European Union(EU):

2.4.1 Similarities of PDB curriculum of (EAC) Tanzania and EU:

The professional bus driver curriculum (BPD) for initial has the same goal of safe driving behaviour and effective customer management. The Directive aims to: Enhance road safety in Europe by ensuring a standard level of training and the achievement of the necessary skills and competencies for professional drivers to drive their vehicles. It establishes the mandatory level of initial qualification and periodic training for professional drivers in the European Union. On the other hand, the (EAC) curriculum includes Tanzania aims to: a harmonised curriculum that supports professional training and certification of drivers of large commercial vehicles. It reduced the high incidences of road crashes and fatalities, high operational costs and low productivity (Transaid, 2015). The objectives also are similar, as shown in the table below

Table 4: The objective of curriculum for PBD in (EAC) Tanzania and EU

No	PBD Curriculum in (EAC) Tanzania	BPD Curriculum in EU
1	Objectives • Improve Road Safety in East Africa by reducing the number of road crashes involving large commercial vehicles; thereby reducing the number of fatalities and injuries on the region's roads • Improve transport operations and optimise vehicle operation costs • Standardise training and professional skills of drivers of large commercial vehicles across the EAC.	Objectives • The purpose of the Directive is to raise standards among new drivers and to maintain and improve the professional skills of existing truck and bus drivers throughout the EU. • To increase drivers' awareness of the risks, to reduce risks and increase road safety. • Lays down standards on professional skills to ensure fair competition throughout the EU.
2	The required minimum driving licence of category D1, valid old driving license class E or C	The required driving licence of category D1, D1+E, D or D+E, as defined in Directive 2006/126/EC, or a driving licence recognised.
3	Medical examinations like vision and hearing, Occupational, psychological examinations	Medical examinations, like vision and hearing Occupational, psychological examinations
4	Digital electronic driving licenses	Digital electronic driving licenses

Source: Trademark East Afriaca & Transiad (2015) and COM/2017/047 final - 2017/015 (COD)

2.4.2 Different of PBDs curriculum of (EAC) Tanzania and EU:

Significant different approaches are developing and implementing the Professional Bus Driving (PBD training programme in Tanzania and European countries. In Europe, their many studies related the professional bus driver training programmes like ProfDRV project (2011), ETF, IRU (2013), CIECA (2014), PRAISE Report (2014), ETSC PIN Flash No24 and ex-post evaluation. This research improves the qualities of driver education and brings good guidance policy to decision-makers in the European Commission. Moreover, the number of death caused by bus is lower compared to Tanzania. European Commission (2016) stated that the most recent data from 2014 show 751 killed in those involving buses and coaches contrast. Tanzania data obtained from police revealed 5869 road traffic crashes in six months, April to September 2014(Boniface R. et al., 2016).

Furthermore, Training approaches based on the Driver Education matrix (GDE) in Europe has well designed in hierarchical levels. For example, GDE-5PRO (PRO for professionals and their organisational environment) helps describe a professional driver and a private driver (Keskinen, Peräaho & Laapotti, 2010). Formal Training for professional drivers, particularly Training in defensive driving taught at the workplace, combined with motivation and incentive systems, reduced the accident

rate by around 20%. (Rune Elvik et al., 2009). For buses and coaches, a decline in fatalities was observed from 2001 to 2010 from 1,115 to 692. In contrast, Tanzania does not have precise GDE hierarchical levels and road safety training for logistic companies is very few (SUMMATRA, 2017).
However, the Land Transport Regulatory Authority (LATRA) has played a significant role in providing the mutual recognition of professional drivers in Africa regional corridors via regional agreements; the United Republic of Tanzania and member states of the East African Community (EAC), Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) blocks and Tripartite Agreements. Drivers use digital licence for easy electronic transfer of information (LATRA ACT NO 3 OF 2019).In contrast, European countries still face mutual recognition of professional drivers in their countries (Ariane D.2018).
ALL in all, Europe has well organised the periodical professional Training and Member States allowed eLearning usage as ICT tools for a part of the training while ensuring the quality of the driver training. In addition, ICT could be a supporting complement but should not replace training eLearning tool as a technology tool for training. Best practices, especially this period of pandemic disease coronavirus (COVID-19). In contrast, Tanzania does not have a structured periodic training programme. Instead, they use a similar curriculum of initially qualified professionals during systematic bus driver training. Therefore, it seems like a repeating programme and does not have an eLearning training programme as a supportive part of training.

2.5 E-learning systems overview:

The training approaches train bus drivers to improve their skill and safety, including in-person classroom training, electronic learning (e-learning), and a blended approach. In Tanzania, the current curriculum of bus drivers employed different methods of classroom delivery only. Due to technology development, the e-portfolio used in Tanzania for driver instructions in various institutes like Tanzania Revenue Authority (TRA) for payment of licences fee, NIT for enrolment and payment. Also, LATRA tracks bus driver information while traffic police fines paid by an electronic machine. Also, driving school VETA in Dar es Salaam and NIT have good access to internet infrastructure. NIT has an ELearning platform but not driver training. The eLearning for driver training is new because people who drive commercial vehicles for the last decades were not well educated, and telecommunication technology was deficient. Thus far, there was no successful substitute for the classroom to the use e-learning training approach. This study will research on who to incorporate the bus driver curriculum with the eLearning approach.

2.5.1 The existed situation for eLearning in Tanzania:

E-learning provides a radical new approach to the educational process for young and adult learners who cannot attend on-campus and face-to-face traditional learning. In the perspective of lifelong learning, eLearning technologies can intensify learner's motivation, provide better information accessibility, promote creative secondary communication and thus stimulate learners thinking (Wanyaga et al., 2015). The E-learning system is beneficial for trainers and learners located across the world, and learners can access information without having restrictions of time, location, interactivity, and flexibility in terms of fascinating an increasing number of learners (Nawaz et al. 2014)
In Tanzania, e-learning systems enhance teaching and learning at several higher learning institutes and universities. The University of Dar es Salaam uses it for a long time since the 1990s when the university acquired the Blackboard system under the Technology Enhanced Independent Learning (TEIL) project. Through this initiative, intensive training conducted on how to use the system. As a result, 402 courses were created and uploaded by the end of 2007 (Mtebe et al., 2011). Muhimbili University develops the survey questionnaires regarding the adoption of eLearning by Lwoga (2014). The survey questionnaires sent to 408 undergraduate students, and the return rate was 66.7%. Results revealed that quality-related

factors such as instructor and system are a crucial predictor of perceived usefulness and user satisfaction for the learners' further usage intention of e-learning.

A study conducted by Mosha and Bea (2014) at the Mzumbe University with a total of 50 participants selected randomly from 5 faculties, two institutes, and three directories of the university revealed that several eLearning factors include lack of skills on how to search internet resources, lack of consistent technical and support. Also, computer viruses limit access to e-resources, inadequate PCs, lack of training on how to access and use resources, and poor internet connectivity. Thus, among factors that would consider while implementing the eLearning bus driver professional drivers training programme.

2.5.2 E-learning as alternative approaches for bus driver training:

Driver education is considered a long-lasting or even a life-long process (Vissers et al., 2007). The Internet-driven technological revolution has a significant role in facilitating driving training using e-learning as part of an educational strategy that improves traffic safety. Thus, achieved through a blended curriculum that includes both supervised e-learning and facilitated group discussions in a classroom setting that takes advantage of peer pressures. Apart from that, different age cohorts, learning styles, and comfort with electronic devices are critical variables for this research. The variables factored into the decision-making process, and a curriculum developed to ensure that learning drives the outcomes.

Urdan and Weggen (2000) stated that higher retention of content through personalised learning is possible because technology-based (e-leaming) solutions allow more room for individual differences in learning styles. Also, Chute et al. (1999) stated, "E-leaming can provide a cost-effective solution to the most demanding training and education needs by using acceptable media to deliver a variety of training types. The technology acceptance model (TAM), presented by Davis (1989), stated that eLearning predicts users' behaviour based on their attitudes toward information technology and intentions to use the system. Many reviewed materials argue about whether traditional classroom learning could replace by e-learning. Table5 below shows the advantages and disadvantages of e-learning and formal classroom learning summarised by Zhang et al. (2004).

Table 5. E-learning V.S. Traditional classroom learning

	Traditional classroom learning	E-Learning
Advantages	• Immediate feedback • Being familiar with both instructor and learners • Motivation learners • Cultivation social community	• Learner-centred and collaborated in task, projects, concepts and information as a team. • Time and location flexibility • Cost-effective to learners • Potential available to a global audience • Unlimited access to knowledge • Archival capacity for knowledge reuse and sharing • Easy national standardisation of the knowledge training curriculum • Learning style: auditory and kinetic learners via stories, videos, audio clips, simulations, practise, and feedback. • It is self-paced and self-managed based on a performance-based curriculum rather than an hours-based curriculum.
Disadvantage	• Instructor-centred • Time and location constraint • More expensive to deriver • Trainers are more effective than other	• Lack of immediate feedback in asynchronous e-learning • Increase preparation time for instructors • Not comfortable to some people, and some learners feel isolated • Potentially more frustration, anxiety and confusion and lack of natural collaboration.

Sources: Zhang et al. (2004)

2.5.3 Overview of an eLearning (Blended) bus driver training curriculum:

Blended learning described as "the mix of traditional teaching methods, such as face-to-face teaching and online teaching" (Bliuc et al., 2007, p. 233). Due to its simplicity, this is perhaps the most common meaning of blended learning used in a higher education context. The technology development and current crises of pandemic diseases coronavirus (COVID-19) influenced the eLearning (blended) usage in many organisation in developed and developing countries. In Tanzania, eLearning (blended) for bus driver training has not used as a model of teaching for past decades. Thus, due to many factors, low education level, most of them were primary school level, lack of technology infrastructure in driving school, perception of trainers, and organisation willingness to adopt the technology. The evidence-based from developed countries like Europe and the United States of America has been used eLearning (blended) for more than two decades past has positively impacted road safety. The mixed of traditional classroom experience with eLearning technology and testing known as an eLearning (blended) curriculum could occur in Tanzania for Bus driver training. This curriculum style combines the benefits listed above for traditional classroom learning but avoids most of the negatives. The recommended blended curriculum includes face-to-face social sharing opportunities among the trainees as peers, which is the only truly effective means for shaping skill and improves road safety.

Dowling et al. (2003) analysed whether a hybrid, flexible teaching method compared to traditional face-to-face lectures improved learning outcomes. Their results suggested a positive change in student grades when combining the conventional and extensive multi-media resources. Also, Jones et al. (2009) incorporated a continuum of eLearning (blended) learning, which begins with no ICT. Then progresses through the most basic information and communication technology level used to support face-to-face teaching, intensive use, whereby the whole module is delivered online with minimal or no face-to-face interaction, as shown in figure 4. Thus, bus driver training in Tanzania to choose the level of online technology may need based on their context in developing an eLearning (blended) bus driver training curriculum.

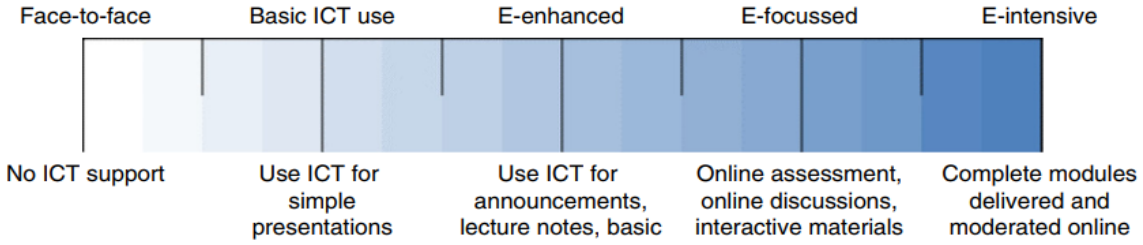


Figure 4: Enhanced continuum of eLearning (blended) learning. Source: (Adapted from Jones et al. 2009, p. 15)

Currently, the professional bus driving school NIT and VETA use the face-to-face up to E-enhanced stage as part of instructions and learning, which brings the confidence of adoption to the E-intensive when there is a commitment to use for training drivers.

2.5.4 A framework for adoption of eLearning for driver training:

Lindh et al. (2008), implementing an e-learning environment is a complex phenomenon, comprising many influencing factors. The prerequisites of the e-learning implementation also vary, depending on whether the e-learning technology used in distance education or blended learning. Garvey (2011) advocated a blended learning programme model; this model includes an action-learning workshop using real-life case studies and independent e-learning. Also, traditional instructor-led classroom training, on-demand reference tools, webinars, podcasts and more. The effective adoption of eLearning (blended) involves three-phase readiness, intensity, and impact as described by the Organisation for Economic Co-operation and Development model of a business model(2005) shown in figure 5 below. Thus, readiness involves preparing the technical, commercial and social infrastructures necessary to support

eBusiness; intensity is the state or level of adoption and use of eBusiness, its volume, value and the nature of the transactions; and impact is the added value that is potentially created (OECD, 2005).

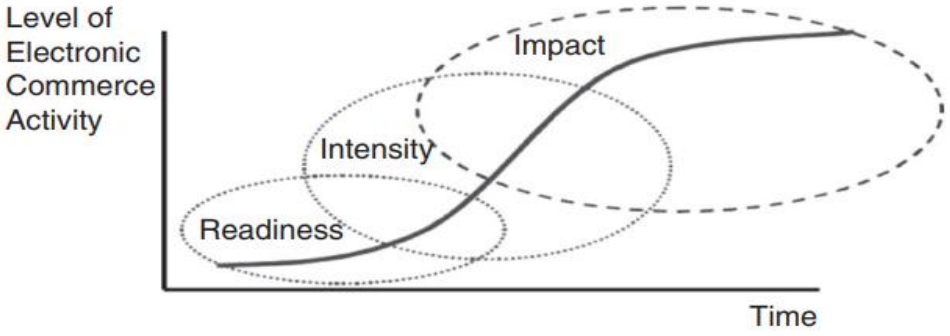


Figure 5: eBusiness indicator framework and it's Adapted from OECD (2005)

However, this framework has been used in many universities and training organisations to develop eLearning (blended) curricula integration. In Tanzania, no driving school use the eLearning tool for driving training. Only university and higher learning institutions have adopted eLearning in limited use. A brief explanation of three phases of adoption based on professional driver training curriculum context describe below.

2.5.4.1 Readiness:

The first stage which some time is known as readiness. At this level, willingness considered to assess various attributes, such as levels of connectivity, general business climate, available infrastructure, available human resources and so forth (Rizk, 2004).In Tanzania, the readiness for the bus driver training programme of eLearning (blended) required considering the following attribute; firstly, Institutional wiliness, particularly driving school like NIT, VETA were willing to spend the necessary funds. Secondly, trainer readiness to support eLearning suitable material and technical resources, and bus drivers level of time commitment, discipline, and interest in adopting the diverse curriculum, thus current curriculum and incorporating eLearning (blended) method. Third, the social culture readiness and acceptance the eLearning. Finally, technical readiness describes user friend tool and devices that will influence the needed outcome. As described by a previous research study, the institutional leaders are responsible for guiding and facilitating organisational change (McPherson & Nunes, 2006) by providing strategic direction, adequate resources and recognition of success (Nichols, 2008). Russell (2009) suggests that innovations need to be woven into the organisational context and centrally coordinated. NIT and VETA have qualified to have a degree of level to be ready to adopt eLearning. Currently has used face to face up to E-enhanced level for driving training programs and eLearning course to other courses (National Institute of Transport Entrepreneurship and Business Innovation Center (NITEBIC, 2021).

2.5.4.2 The intensity of adoption:

As the discussion on readiness suggested, decisions related to bus driver e-learning adoption can be complex. Thus, understand the benefits and problems associated with innovations in teaching (such as different forms of online delivery). It is supportive to consider one of the theories of technological innovation (Al-Hajri and Tatnall, 2007), such as the Theory of Reasoned Action (Ajzen and Fishbein, 1980), the Theory of Planned Behaviour (Ajzen, 1991), the Technology Acceptance Model (Davis, 1989) and Diffusion of Innovations (Rogers, 2003). The Technology Acceptance Model (TAM) and Diffusion of Innovations, in particular, consider characteristics of the innovation and the potential adopter as crucial factors in developing the driving curriculum, which includes the eLearning (blended) method. The adoption of eLearning should consider both human and non-human influences factors. The human factors involve demographic features (age, gender, and level of education), attitude, awareness,

and perception toward using the technology. While, non-human influences as describes the technology infrastructures (connectivity), government policies and user-friend tool. Adaptations of TAM and diffusion theory explain technology acceptance in various transportation contexts, including switching intentions towards public transport (Chen & Chao, 2011), eco-driving interfaces (Hötl & Trommer, 2012). Venkatesh et al. (2003).

2.5.4.3 *Impact on improving the bus driver skills and road safety:*

The linkage readiness and intensity of adoption and the impact on increasing the skill and road safety are difficult to understand. However, once institutions and trainers have adopted a range of options across the enhanced blended learning continuum (refer again to Figure4) as part of their composite learning suite, bus drivers' readiness influences their intensity of adoption and their impact on their training. For example, Buzzetto-More (2008) reported that student attitudes towards technology influence the educational benefits of online learning resources and experiences. Technology-based training programmes can give participant's exposure to risky scenarios that they may otherwise rarely face on-road in a safe environment. Results have shown some improvement in hazard perception, attention maintenance, visual scanning behaviour, and road hazard handling performance in simulated driving (RACV, 2016).

2.5.5 Theory framework:

Based on the OECD business shown in figure 6, the theoretical framework describes the Indicator framework but tailored for bus driver training programme based on mixed traditional and eLearning (blended). The curriculum provides the overview of the program regarding the combined learning experience regarding readiness: taking into consideration institution readiness, trainer's readiness and bus driver's willingness, which involves the variable of awareness, perception and interest.

The intensity of adoption: in this instance, the power of adoption considers the blended learning options selected for adoption by trainers and the adoption of those options by the driver. The selection option involves the type of programme bus driver required to enrol, whether novel bus driver education, Initial qualified professional driver and periodic driver training programmes. Also, the trainers could decide the paradigm method of training classroom, in-vehicle practices and eLearning based on the adoption of an enhanced continuum of eLearning (E-enhances-focused and E-intensives). The target eLearning tool should be intensive for theory and simulation studies. Its Impact: or Quality of learning achieved. Quality of learning can be evaluated via several means, as discussed in the previous section.

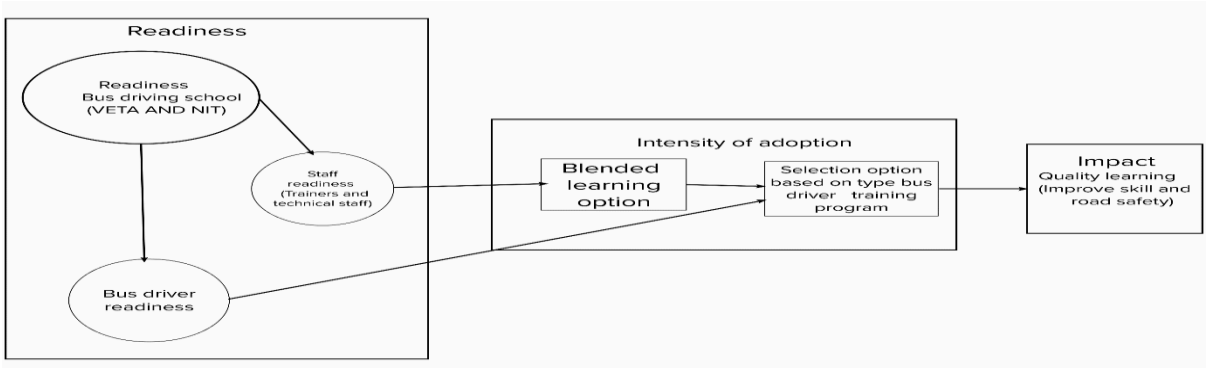


Figure 6: the theoretical framework of eLearning adoption for PBDT

2.6 Research gap

Tanzania's professional driving curriculum for initial qualification has covered major relevant topics to be trained and harmonized within the East African countries. The implementation of professional buses driver has reduced the rate of accident compared before. The following are Tanzania challenges observed in the literature review when compared with European professional bus driver's syllabus and directives.

- Lack of structured curriculum of periodic professional bus drivers
- Lack of use of eLearning tool as IST tool for part of training programmes
- Lack of enough simulator for driver practice only found in NIT.
- Organization road safety does not evolve direct logistic company officers
- Scarce of data and research of assessment impact of implementing initial qualification training courses of professional bus driver training programmes.
- Lack of auditing and quality assurance processes are vital in maintaining a good driver training standard in East Africa.

Harrison (2010) described that Tanzania, like other parts of Africa, suffers typical infrastructure problems, namely, insufficient computers and funds, proper development of curricula for teaching e-learning skills, and lack of teachers trained to integrate e-learning in their teaching.

CHAPTER 3 METHODOLOGICAL APPROACH TO THE STUDY:

3.1 Introduction:

This chapter presents the research methodology which the researcher employed. The study's objective is to provide professional driver training programmes for a Bus driver in Tanzania through E-learning. This programme will increase the knowledge the skill of the safety system approach and reduce severe injuries and fatalities. The study divided into two parts: examining the professional bus driver curriculum in Tanzania and Europe and exploring the potential of eLearning in the world of professional drivers.

3.2 Participants:

The key objective of this study was to understand and predict bus intentions towards a professional bus training curriculum and the adoption of eLearning in Tanzania. The closed-ended structured survey distributed with the help of a simple random sampling technique among prominent NIT, LATRA, BRT, and UMAWATA in the economic city (Dar es Salaam) of a developing country, Tanzania, in February 2021. The data collection process conducted using online mode obtained a total number of 153 complete responses. Out of the 153 respondents, 72% were male, and 28% were female. The educational level of respondents were 37.20% from University, 32.3% from secondary school and below, while 25.5% from college. This research primarily conducted on the professional population to understand their perception towards professional driving curriculum and eLearning adoption. In this sample, 62.1% respondents were bus driver, 8.5% respondents were bus driver trainers and 29.4% other respondents from students from NIT who familiarized with professional driver training in Tanzania. The bus drivers were 95 respondents and categories based on the type of vehicle operate as follows; 32.6% of respondents were long-distance bus, 28.4 % of BRT, 25.3% transit bus (daladala), and 13.7% of a school bus. The previous study conducted by Rwebangira et al. (1999) by a questionnaire survey on the public opinion on bus crashes with 200 randomly selected passengers and long-distance buses and small city buses (daladala).

3.3 Data collection:

Primary and secondary data collection methods conducted to get information from respondents and other sources. The research study based on qualitative research. The preliminary data collected by questionnaire only survey and semi-structured interviews showed only via social media from Dar es Salaam respondents as described in section3.2. Due to COVID-19, the focus group not used in this research study and semi-structured interviews conducted only to the five respondents, three officers from NIT. Thus, remained organization with only one interviewee officer from LATRA UMAWATA, an officer from the NGO of road safety ambassador in Tanzania.

3.3.1 Questionnaire:

The questionnaire was developed based on the research literature, focusing on evaluating bus driver training curriculum and eLearning (blended) adoption literature outlined in Chapter 2. It was created based on a self-reported method to obtain information from bus drivers, trainers, and other road users. In the study, the survey research conducted in the form of an online survey found in Annex1. The tool for collecting survey data known as Qualtrics online survey, which UHasselt offers. Thus questionnaire contained detailed, brief and clear instructions and was created to prompt ease of response. Respondents notified at the front page concerning the nature and the purpose of conducting this research. Respondents advised choosing the most suitable and honest way to answer the questionnaire in either English or Kiswahili.

Additionally, respondents were assured of privacy and confidentiality and told not to write any name that might represent their identity. It also made clear that participation in the study was voluntary and that one would withdraw at any stage without penalty. The institution ethics review personnel granted

ethical approval for the research protocol before data collection. It divided into three parts, as described briefly below. The survey conducted for three weeks from 7th to 28th February 2021, and the average meantime for each despondent was about 5minuties.

a) Demographic characteristics and bus driver behaviour:

Respondents asked about their gender, age, and educational background and occupation status. This section also includes several questions based on licenses, type of bus driver operate, driving age and awareness toward PBT in Tanzania. Also, the measured scale mixed of nominal, interval and Likert scale (strongly disagree, disagree, agree and strongly agree) at all sections of the research survey as shown in Annex 1. Even the previous research considered thus variables, particularly age affects the adoption of eLearning and professional bus driver training in general (Panteia, 2014).

b) The evaluation implemented PBDT curriculum:

The questionnaire of this part based on aspects relating to periodic training of the training hours for practical and theory. In addition to that, teaching methods, exciting contents/module and certification of the driver certification. Furthermore, the survey looked at bus driver assessment and investigated the weakness, benefit, central area, and evaluation method. Even, Eco-driving benefit as previous research from the Royal Society of the Prevention of Accidents (ROSPA, 2018) and the current curriculum for professional bus drivers in Tanzania.

c) The adoption eLearning Aspect for Professional Driver Training:

The last part seeks opinion towards reliance on (blended) e-learning for professional bus driver training programme, proposed devices and perception toward improving road safety (see annexe 1). ROSPA (2018) and Panteia (2014) reveal that E-learning courses can cover the same issues that driver education workshops cover and often include a test at the end to check what the person taking it has learned.

3.3.2 Semi-Structured Interview:

This method concentrated on getting additional information concerning the readiness of institution and trainer staff to adopt the eLearning at NIT. Also, the interview aimed to understand current challenges faced by periodic bus driver training in term teaching method and how eLearning could improve the current situation as part of the study. On top of that, the online-recorded qualitative data collected from five officers from NIT and one official from LATRA. The interviews with NIT trainers ranged widely in length (8:30 to 9:10) East Africa time zone, it approximated averaged 40 min. On the other hand, the LATRA officer interview was typically much short, about 40 minutes and recorded. Lastly, one officer from the commercial driver association (UMAWATA), with only 30 mins gathered information readiness to adopt.

3.4 Data Collection Techniques:

3.4.1 Language Translation:

The researcher conducted the translating process of the English survey tool into the country's official language (Kiswahili) with the help of another two English language professionals. Thu helps to enhance the quality of the translation process and avoid any potential problem; the following consideration suggested by Scherest (1972). Firstly, the researcher explained the detailed orientation of the proposed study and its objective to the translators. The translation process was heavily inclined to maintain the conceptual equivalent, a phrase and experiential meaning of the original tool with the local understanding and usage.

3.4.2 The Pilot Study:

The pilot study conducted a few respondents before conducted the actual survey. The online survey instrument was pre-tested by a random sample of 20 respondents (bus driver) were answered questions as expected by the researcher, which assured the validity and relevancy of the study. The minor change occurred some questionnaire questions for easy to read and observed the relevance of the variables and outcome variables of the study.

3.4.3 Data Analysis Strategy:

The collected data analyzed by software programme statistical package for social sciences version 26 (SPSS v. 26). The questionnaire structured in two parts with a total of 27 closed-format questions. The researcher carried out the statistical description data t-test by comparing the respondent, one way ANOVA and correlation analyses for identifying the relevant and valid variable. The overall approach was to measure the proposed variable that fit hypothesis models and understand the relationship among such constructs. Also, the Chi-Square Tests t-test used the cross-tabulated to investigate the association between the groups and within the groups, particularly on vehicle type bus operations and the professional's group with other variables.

3.4.4 Reliability and Validity:

Reliability and validity are the two most important properties that test scores can have in the given research. The author Nunnally (1978) indicated that when researchers achieve an alpha level of 0.70 or above, it provides sufficient ground for researchers to use their reliable scales with greater confidence in their result. This research was conducted by the statistical package for social sciences version 26 (SPSS v. 26) and calculated the scales' Cronbach‘s alpha reliability coefficient. Cronbach’s alpha coefficient was 0.82, and Cronbach’s Alpha Based on Standardized items was 0.83. Thus justify the acceptances of the study, which measured the attitude, perception and benefit of periodic PBD training programme curriculum incorporated with the adoption of the eLearning. The composite scales of Cronbach‘s alpha reliability coefficient presented in Table 6.

Table 6: Distribution of Cronbach’s Alpha Reliability Coefficient for the Study

Item-Total Statistics	**Reliability Coefficient**
Bus driver behaviour on renewing driving license	.789
Expected training hour(theory)	.758
Expected training hour(practical)	.840
Expected intention toward using eLearning for PBDTs	.774
Perception eLearning on improving road safety	.838
Method of assessing bus driver on PBDTs	.874
Perception for the area of weakness on assessing PBDTs	.768
Expected benefit toward PBDTs	.768
The primary area for assessment	.776

Self-source, 2021

3.5 Research Design;

Professional bus driver training is guided typically by explicit curricula or a list of the skills and knowledge that the learner has to learn and master to pass the driving test. Harold Smith, in 1952 designed and developed a curriculum known as the Smith system, which supports road safety. His idea was that “prevent collisions is possible if the right driving behaviour practised. Drivers taught to observe

surroundings, anticipate challenges and react safely" (1952).This ideal match the research objective of this study as described early in section 1.3.1.

However, design and development (D & D) for this study adopted from Richey and Klien (2007). According to Richey and Klein (2007), design and development research activities involve a systematic process for assessing and developing training solutions designed specifically for standard training delivery. It has four main stages: need analysis (themes and tool), training and design delivery, development and evaluation. Thus, it supported the theoretical framework of the research shown in figure 6. Also, Table 7 show the sequence of stage process expected to provide the desired result for this study.

Table 7: Summary of the research design process

Design Phase	Questions (hypothesis)	Data Collection and Analysis
Analysis	What are the existing, National and Its comparison to the International structured curriculum, bus driver training programmes? (Transaid,2015; ETSC,2010&2017 and SUMATRA,2017)	1.Literature Review 2. Review of e-learning readiness models 3. Review literature for clarification of concepts. 4. Develop themes related to e-learning readiness
Design	Which devices will be effective in developing the e-learning tool regarding the national cultures? (Zoltán et al.2013; and Kisanga D., Ireson G., (2014).	1. Create a first draft of the devices for the eLearning tool. (easy to use and report data)
Development	How is the bus driver stakeholder's response to the e-learning implementation? (Panteia, 2014 and L.J. Romero et al. 2013)	Relate the objectives for tool design to the product 2. Refine the tool
Evaluation	How will the E-Learning driver training programme reduce the risk of a vehicle crash in Tanzania? (ECTA & Cefic, 2013, and IDREAMS,2020 and Brock et al. 2007)	1. Determine the content validity 2. Determine the practicality and effectiveness of the tool

Self-sources:2021

Each module's design will include its training objectives and a brief outline of the information, examples and exercises, and quizzes on the e-learning application tool. This study also adopts insight from other previous research that facilitated content from learning and innovation principles within organizations, knowledge management, adult learning theory and technological support systems (Chen & Chao, 2011). Since the e-learning will support the mix of the form, if the trainee has difficulty answering his or her question, send an email to trainers and ask the trainer or fellow trainee via the discussion forum.

The study collected relevant data using questionnaires and interviews to get opinions from trainees and trainers for suitable contents and eLearning tools. The investigation uses the literature review as described on chapte2 to raise questions for the survey and interview, which helped develop content and adopted a tool for PBDT in Tanzania. The relevant variables for the theme of improving skill and knowledge for bus drivers. The advantage of design and development research allows for flexibility of procedure focused more than one variable on developing the adopted eLearning tool (Van den Akker et al. 2010; Richey &Klein, 2007). Also, the formative evaluation throughout the development process conducted to determine the quality, efficiency and effectiveness of the tool (Van den Akker, Branch, Gustafson & Plomp, 2012).

CHAPTER4 RESULTS:INTERPRITATION AND ANALYSIS

4.1 Demographic Characteristics:

Descriptive statistics used to describe the sample's demographics to place the selection in the context of the general population. First, the number of respondents considered representative of the population based on calculating the total sample number of samples (replication) using the formula from Krejcie & Morgan (1970). Table 8 shows the demographic characteristic of respondents participated in the survey were a total of 153 respondent out of approximately 175. Among all participant, there were female respondents16 (10.5%) and male respondents, 137(89.5%), whose ages ranged from below 25 to 55. Also, respondents divided into three groups Bus drivers, trainers and other road users. A majority of them were bus driver 95(62.1%), followed by other road users 45 (29.4%) and trainer 12(8.5%). The majority of respondents were between 35 to 44 years, 94 (61.4%) with a mean age of 2.82 mean scores.

Table 8: The variable background of demographic characteristics: Percentage

Variable	Classification	Overall	
		N	Percentage (%)
Sex	Male	126	82.4
	Female	27	17.6
AGE	Below 25	17	11.1
	25 to 34	39	25.5
	35 to 44	94	61.4
	45 to 54	3	2.0
Educational level	Primary school	8	5.2
	Secondary school	51	33.3
	College	39	25.5
	University	55	5.2
Occupation	Other	45	29.4
	Trainer	13	8.5
	Bus driver	95	62.1
Driving licence	Yes	122	79.7
	No	31	20.3
Type of vehicle bus drivers	School bus	20.3	32.6
	Bus Rapid Transport (BRT)	8.5	13.7
	Transit bus (Halladale)	17.6	28.4
	Long-distance passenger bus	15.7	25.3
Awareness toward PBDTs	No	19	14.6
	Yes	111	85.4

Source-Self, 2021

Moreover, Chi-Square Tests t-test conducted to determine if frequency differences for type vehicle operators (school bus SC, Transit TS, Bus of Rapid Transit BRT, and Long-distance Bus LD) sex, age, and awareness of participant toward PBDs from the survey result. As can be seen by the frequencies cross-tabulated in Table 9, there is a no significant relationship between vehicle driver's operators and the gander (male and female) $\chi 2$ (9, N = 95) = 8.755, p =.460 and age $\chi 2$ (9, N = 95) = 8.755, p =.460 and $\chi 2$ (3, N = 95) = 2.086, p =. 555.

Table 9: frequencies cross-tabulated bus drivers and gender, age and awareness toward PBDT

Item	Classification		BUS DRIVERS				Overall	Test statics
			SB	TS	(BRT)	LD		
Gender	Male	N	11	22	22	26	81	
		%	13.6	27.2	27.2	32.1	100.0	$\chi 2$ (9, N = 95) = 8.755, p = .460.
	Female	N	2	2	5	5	14	
		%	14.3	14.3	35.7	35.7	100.0	
Age	Below 25	N	0	1	0	0	1	$\chi 2$ (9, N = 95) = 8.755, p = .460
		%	0.0	100.0	0.0	0.0	100.0	
	25 to 34	N	3	8	4	9	24	
		%	12.5	33.3	16.7	37.5	100.0	
	35 to 44	N	8	15	19	18	60	
		%	13.3	25.0	31.7	30.0	100.0	
	45 to 54	N	2	0	4	4	10	
		%	20.0	0.0	40.0	40.0	100.0	
Awareness Toward PBDT	No	N	2	4	7	1	14	$\chi 2$ (3, N = 95) = 6.035, p =. 110
		%	14.3	28.6	50.0	7.1	100.0	
	Yes	N	11	20	20	30	81	
		%	13.6%	24.7%	24.7 %	37.0%	100.0%	

Self-source

Furthermore, Table9 described the cross-tabulated and independent-samples chi-square test conducted to determine an association between vehicle bus drive operators and awareness toward PBDT. A chi-square test of independence showed no significant association between type bus driver and understanding of TPDT in Tanzania, $\chi 2$ (3, N = 95) = 6.035, p =. 110. These results suggest that the attention toward the PBDT was greater to male than female. Thus, currently more male is primarily engaged in Bus driver work than female.

In addition to that, the professional driver experience participated were calculated in cross-tabulated as shown in table 10. The bus drivers who are the lowest frequency was (1-2 years) having 5(5.3%) of participants followed by (<1 year) with (15(15.8%) of participants while >5 years with frequency 22(23.2%) was having slight difference to (3-5 hour) was 23(24. 2%). On

the other hand, the total frequency distribution within the group was 13 (13.7%) of SB

BUS DRIVER EXPERIENCE IN AGE (EA)		BUS DRIVER SB	TS	BRT	LD	Overall
<1 year	Count	6	1	4	4	15
	% within EA	40.0%	6.7%	26.7%	26.7%	100.0%
	% within BUS DRIVER	46.2%	4.2%	14.8%	12.9%	15.8%
	% of Total	6.3%	1.1%	4.2%	4.2%	15.8%
One year	Count	3	11	9	7	30
	% within EA	10.0%	36.7%	30.0%	23.3%	100.0%
	% within BUS DRIVER	23.1%	45.8%	33.3%	22.6%	31.6%
	% of Total	3.2%	11.6%	9.5%	7.4%	31.6%
1-2 year	Count	0	0	1	4	5
	% within EA	0.0%	0.0%	20.0%	80.0%	100.0%
	% within BUS DRIVER	0.0%	0.0%	3.7%	12.9%	5.3%
	% of Total	0.0%	0.0%	1.1%	4.2%	5.3%
3-5 year	Count	1	7	5	10	23
	% within EA	4.3%	30.4%	21.7%	43.5%	100.0%
	% within BUS DRIVER	7.7%	29.2%	18.5%	32.3%	24.2%
	% of Total	1.1%	7.4%	5.3%	10.5%	24.2%
>5 year	Count	3	5	8	6	22
	% within EA	13.6%	22.7%	36.4%	27.3%	100.0%
	% within BUS DRIVER	23.1%	20.8%	29.6%	19.4%	23.2%
	% of Total	3.2%	5.3%	8.4%	6.3%	23.2%
Total	Count	13	24	27	31	95
	% within EA	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

participants, followed by 24 (25.3%) TS participants. The last two groups (BRT and LD) distributed a slight difference of 27(28.4%) and 31(32.6%) of participants, respectively.

Table 10: The driving experience of the bus driver who participated in the survey

Self-source, 2021

Furthermore, a one-way analysis of variance (ANOVA) calculated on participants' bus driver driving experience based on their type of vehicle operated. The analysis was not significant, $F(3, 91) = 1.13$, $p = .338$ ($r = .23$). Table 11 shows the mean driving age experience trend, which

reflected the reality of the whole population sample. The mean of holding driver licenses from the respondent was (M=1.80, Median= 0.411 and SD= 0.398). It ranged from 0 to 54 years.

Table 11: the mean score of background variable of demographic characteristics

Variable	Classification	N	M	S.D
Age	< 1 25=1, 25 to 34 =2, 35 to 44= 3, 45 to 54= 4 and 55	153	2.82	0.64
Education level	Primary school=1,Secondary school= 2 College=3 and University=4	153	2.92	0.95
Driving license	Yes=2, No=1	153	1.80	0.40
Occupational status	Bus driver=1, Trainer=2 and other road users =3	153	1.67	0.90
Bus driver category	Long distance passenger bus = 1,School bus= 2, Transit bus (Daladala) = 3 and BRT =4	95	2.70	1.05
Driving experience	< 1 year=1, 1 year =2,1-2 year=3,3-5 year=4 and>5 year=5	95	3.08	1.46
Awareness toward PBDTs	Yes= 2, No= 1	95	1.85	0.36

4.2 Development of contents for eLearning PBDT in Tanzania:

An evaluation of initiation accompanied the development of the eLearning training programme for bus driver qualified professional bus curriculum of East Africa (2015), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019). The analysis of the theme and factor of adoption tool in the survey classified into three categories; learning process (education) and evaluation of training (trainee assessment) in Tanzania.

4.2.1 The evaluation learning process (Education) for PBDT in Tanzania:

During designing, the professional bus driver learning process mainly depends on three central aspects; goal, contents, and trainer method style. Effective implementation aligned with client goal, acceptance of contents and method (Spoerer, Ruby & Martl, (2001). The analysis of this survey provided the respondent's input to expected design courses and the training process used in the current curriculum. The survey shows the hour of periodic PBDs training for theory and practical were 35 hours (54%) with a statistical mean of 1.90 and (53.3%) with a statistical mean of 2.69, respectively. The current standard method used for teaching the PBDs of the training programme includes conventional classroom 33 of respondents(31.4%), practical demonstration instructions 29 of respondents (27.2%), group discussion 6 of respondents (5.7%) and combination methods 37 of respondents (35.25%) with professional drivers. Thus, justify how bus drivers are training from qualified training institutes such as NIT and VETA. The previous study also conducted in Tanzania described the method of teaching in recognized driving school used the classroom and trainers used to provides instructions and practical training (SUMATRA, 2017). Table 12 below shows descriptive statistical data.

Table 12: Evaluation learning process (Education) for PBDT in Tanzania

variable	N	Min	Max	Mean	S.D
willingness to attend PBDT	103	1	2	1.82	0.39
Expected training hour(theory)	107	1	4	1.90	1.12
Expected training hour(practical)	107	1	4	2.66	0.79
Learning methods	105	1	4	2.45	1.26
Selection of module for PBDT	95	1	4	2.22	0.81
Satisfaction of PBDT programme	95	1	3	2.77	0.44

Self-Source:2021

Moreover, the questionnaire survey's analysis of training needs was made from bus driver's responses, as shown in table 13. The setting based on GDE-matrix specific on level IV and V aspects describe by Keskinen, Peräaho & Laapotti (2010). The survey targets the specific course that will improve skill and raise awareness toward road safety and drivers' health. The module selected were; customer service (passenger managements), defensive driver training, injury prevention, health and ergonomic and fuel efficiency (eco-driving).

Furthermore, descriptive cross-tabulation conducted to evaluate the bus drivers attending the bus drivers training in Tanzania. The results in Table 13were aggregated and recorded. The results revealed 0.0 % of a school bus(SB), 20.8 % of transit (daldala)(TS), 18.5 % bus driver transit(BRT) and 29% of a long-distance bus(LD) of participants their show unwilling to attend the periodic bus driver training in Tanzania. On the other hand, the total score of willingness to participate in the driver training was 13.7% of SB, 25.3 % of TS, and 28.4% of BRT and 32.6 % LD of participants were willing to attend the PBDT. Generally, there was no significant statistical differences score of participants compared within the variable of willingness, and against the bus drivers, an in-vehicle bus operated. Thus, the result was similar and showing that the required awareness campaigned based on the PBDT to bus drivers in Tanzania.

Table 13: Willingness to attend the professional bus driver training in Tanzania

		BUS DRIVER				
WILLINGNESS TO ATTEND PBDT(WL)		SB	TS	(BRT)	LD	Total
No	Count	0	5	5	9	19
	% within WL	0.0%	26.3%	26.3%	47.4%	100.0%
	% within BUS DRIVER	0.0%	20.8%	18.5%	29.0%	20.0%
	% of Total	0.0%	5.3%	5.3%	9.5%	20.0%
Yes	Count	13	19	22	22	76
	% within WL	17.1%	25.0%	28.9%	28.9%	100.0%
	% within BUS DRIVER	100.0%	79.2%	81.5%	71.0%	80.0%
	% of Total	13.7%	20.0%	23.2%	23.2%	80.0%
Total	Count	13	24	27	31	95
	% within WL	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

Self-source, 2021

4.2.2 The duration of PBDT for theory and practical (in term of hours)

A Chi-square test of independence calculated comparing the frequency of maximum hours of PBDT in SB, TS, BRT, and LD participants. The table 14 shown the result, there is significant differences association was found ($\chi 2$ (9 (95) = 24.312, $p < .05$). In general, the total score of cross-tabulate of the bus driver and expected maximum time of theory were (13.7%) of SB, (25.3 %) of TS and (32. 6%) of LD. The item (35 hours) was highly recommended by participant s about 55.8% of the participant, followed by item (45 hours) 18.9%. In comparison, item (45 hours) was 13.7% of all participants; lastly, the item (52 hours) less recommended by participants, which means it should be not considered in developing the PDBT for bus drivers. Even previous research recommended the 35 hours for periodic

professional commercial vehicle training such as (Panteia, 2014) as described in directive 2006/126/EC/ of European commission publications.

Table 14: The bus driver opinion toward training hour (theory) for PBDT in Tanzania

		BUS DRIVER				
EXPECTED TRAINING HOUR(THEORY) ET		SB	TS	(BRT)	LD	Total
35 hours	Count	8	21	15	9	53
	% within ET	15.1%	39.6%	28.3%	17.0%	100.0%
	% within BUS DRIVER	61.5%	87.5%	55.6%	29.0%	55.8%
	% of Total	8.4%	22.1%	15.8%	9.5%	55.8%
45 hours	Count	0	0	4	9	13
	% within ET	0.0%	0.0%	30.8%	69.2%	100.0%
	% within BUS DRIVER	0.0%	0.0%	14.8%	29.0%	13.7%
	% of Total	0.0%	0.0%	4.2%	9.5%	13.7%
46 hours	Count	4	2	4	8	18
	% within ET	22.2%	11.1%	22.2%	44.4%	100.0%
	% within BUS DRIVER	30.8%	8.3%	14.8%	25.8%	18.9%
	% of Total	4.2%	2.1%	4.2%	8.4%	18.9%
52 hours	Count	1	1	4	5	11
	% within ET	9.1%	9.1%	36.4%	45.5%	100.0%
	% within BUS DRIVER	7.7%	4.2%	14.8%	16.1%	11.6%
	% of Total	1.1%	1.1%	4.2%	5.3%	11.6%
Total	Count	13	24	27	31	95
	% within ET	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0 %	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

Self-source, 2021

Table 15 portrayed the frequency of participants on suggesting the duration of time practical training in PDBT in found by compared the response between SB, TS, BRT and LD. The result from the Chi-square test of independence deployed that there is no significant differences association was, ($\chi 2$ (9 (95) = 14.51, p >.05). The maximum hour proposed from participants was 35 hours with (56.8 %) followed by 28 hours with a percentage of (25.3%) and 46 hours with (10.5%), the lowest frequency was 57 hours with (7.4%) of all participants. On the other hand, the lowest group of the contribution their view among them serve and across the other group of the bus driver was SB (13.7%), followed by TS (25.3%), BRT (28.4%) and LD (32.6) respectively.

Table 15: The bus driver opinion toward training hour (practical) for PBDT in Tanzania

EXPECTED TRAINING HOUR(PRACTICAL) PT		BUS DRIVER SB	TS	(BRT)	LD	Overall
18.5 hours	Count	1	2	2	2	7
	% within PT	14.3%	28.6%	28.6%	28.6%	100.0%
	% within BUS DRIVER	7.7%	8.3%	7.4%	6.5%	7.4%
	% of Total	1.1%	2.1%	2.1%	2.1%	7.4%
28 hours	Count	5	5	6	8	24
	% within PT	20.8%	20.8%	25.0%	33.3%	100.0%
	% within BUS DRIVER	38.5%	20.8%	22.2%	25.8%	25.3%
	% of Total	5.3%	5.3%	6.3%	8.4%	25.3%
35 hours	Count	7	17	17	13	54
	% within PT	13.0%	31.5%	31.5%	24.1%	100.0%
	% within BUS DRIVER	53.8%	70.8%	63.0%	41.9%	56.8%
	% of Total	7.4%	17.9%	17.9%	13.7%	56.8%
57.5 hours	Count	0	0	2	8	10
	% within PT	0.0%	0.0%	20.0%	80.0%	100.0%
	% within BUS DRIVER	0.0%	0.0%	7.4%	25.8%	10.5%
	% of Total	0.0%	0.0%	2.1%	8.4%	10.5%
Total	Count	13	24	27	31	95
	% within PT	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

Self-source-2021

Furthermore, an analysis of variance showed that the effect of type learning method on the satisfaction of professional bus driver training programme was not significant, F (3, 75) = 0.76, p = .519. The mean (M= 1.25) and standard deviation (S.D=0.44) respondents was highest followed by practical demonstration and instruction (M= 1.23, S.D=0.43) while the group discussion method was lowest (M= 1.00, S.D=0.00). Also, the cross-tabulation conducted shown in table 16 observed the distribution of bus driver participants' frequency based on their vehicle operations. The result deployed shows that the highest frequency for bus drivers was mixed learning (see all above in the table) with 32.6 %. Common traditional methods (classroom and practical training) were 29.5% same values crossing all groups of participants. While the group discussion response was lowest at 7.4%, as discussed by a trainer from NIT during the semi- interview, it wasn't easy to formulate the group discussion after classroom sections. It requires a modernized method that facilitates discussions like the eLearning platform. Even Brock et al. (2007) shows different training strategies and methods applied in the commercial sector in the US was classroom lectures. Burchert and Petermann (2011) described a study from seven countries in Europe revealed that classroom training lessons supported by multimedia tools like PowerPoint presentations, films, photos, et cetera.

On the other hand, Schulte et al. (2014: p.48- 49) described instruction as a technique where the learner gets direct information on acting or thinking. Also, in a practice context, this technique can be helpful (for instance, to train hazard perception and hazard responsiveness), as was demonstrated in studies with young novice drivers (Crundall et al., 2010). However, Schulte et al. (2014: p. 47) explained that guided group discussion required a leader who organized structured questions related to the study content. Also, the NovEV-project done by CIECA (Sanders and Keskinen, 2004) shows the effectiveness of using the discussion group on post-license training programmes.

Table 16: The identification of the existed learning method for bus driver in Tanzania.

		BUS DRIVER				
LEARNING METHOD		SB	TS	BRT	LD	Total
Classroom sessions	Count	4	8	10	6	28
	% within LEARNING METHOD	14.3%	28.6%	35.7%	21.4%	100.0%
	% within BUS DRIVER	30.8%	33.3%	37.0%	19.4%	29.5%
	% of Total	4.2%	8.4%	10.5%	6.3%	29.5%
Practical demonstration and instruction	Count	5	7	6	10	28
	% within LEARNING METHOD	17.9%	25.0%	21.4%	35.7%	100.0%
	% within BUS DRIVER	38.5%	29.2%	22.2%	32.3%	29.5%
	% of Total	5.3%	7.4%	6.3%	10.5%	29.5%
Group discussion	Count	1	4	1	1	7
	% within LEARNING METHOD	14.3%	57.1%	14.3%	14.3%	100.0%
	% within BUS DRIVER	7.7%	16.7%	3.7%	3.2%	7.4%
	% of Total	1.1%	4.2%	1.1%	1.1%	7.4%
All above	Count	3	5	10	14	32
	% within LEARNING METHOD	9.4%	15.6%	31.3%	43.8%	100.0%
	% within BUS DRIVER	23.1%	20.8%	37.0%	45.2%	33.7%
	% of Total	3.2%	5.3%	10.5%	14.7%	33.7%
Total	Count	13	24	27	31	95
	% within LEARNING METHOD	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

Self-source, 2021

A Chi-square test of independence calculated by associating the frequency for the learning method of PBDT in SB, TS, BRT, and LD participants. There is no significant relationship between vehicle driver's operators and the learning method used by bus drivers (classroom session, practical, discussion and mixed-method all above) was $\chi 2$ (9, N = 95) = 9.595, p =.384

4.2.3 Proposed training contents for eLearning

The content for PDBT was among the purpose of the research to investigate the bus drivers' interest in the course. Table 17 show that the bus drivers are highly preferred the defensive training crossing all group type of vehicles with 38.9%, followed by fuel efficiency with 16.8% of all participant al groups of vehicles operates by bus drivers. While Injury prevention and Heath and ergonomic have the same frequency, about 15.8% of all bus drivers participated in the survey. On the other hand, the result from the Chi-square test of independence shows that: there is no significant association between a selection of learning contents and type of vehicle driver-operated of bus drivers all of the learning content are important in all kind of bus drivers, $\chi 2$ (12, N = 95) = 16.768, p =.384. IDREAMS (2020) analysed the source of the differences of literature review based on the learning contents that influence road safety, fuel economy, and heath to commercial drivers, including bus drivers.

Table 17 selected learning content for PBDT for bus drivers

		BUS DRIVER				
Learning content for	PBDT(LC)	SB	TS	BRT	LD	Total
Customer service	Count	2	5	0	5	12
	% within LC	16.7%	41.7%	0.0%	41.7%	100.0%
	% within BUS DRIVER	15.4%	20.8%	0.0%	16.1%	12.6%
	% of Total	2.1%	5.3%	0.0%	5.3%	12.6%
Defensive driving	Count	7	7	14	9	37
	% within LC	18.9%	18.9%	37.8%	24.3%	100.0%
	% within BUS DRIVER	53.8%	29.2%	51.9%	29.0%	38.9%
	% of Total	7.4%	7.4%	14.7%	9.5%	38.9%
Injury prevention	Count	1	1	7	6	15
	% within LC	6.7%	6.7%	46.7%	40.0%	100.0%
	% within BUS DRIVER	7.7%	4.2%	25.9%	19.4%	15.8%
	% of Total	1.1%	1.1%	7.4%	6.3%	15.8%
Health and	Count	2	6	3	4	15
ergonomic	% within LC	13.3%	40.0%	20.0%	26.7%	100.0%
	% within BUS DRIVER	15.4%	25.0%	11.1%	12.9%	15.8%
	% of Total	2.1%	6.3%	3.2%	4.2%	15.8%
Fuel efficiency	Count	1	5	3	7	16
	% within LC	6.3%	31.3%	18.8%	43.8%	100.0%
	% within BUS DRIVER	7.7%	20.8%	11.1%	22.6%	16.8%
	% of Total	1.1%	5.3%	3.2%	7.4%	16.8%
Total	Count	13	24	27	31	95
	% within LC	13.7%	25.3%	28.4%	32.6%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	13.7%	25.3%	28.4%	32.6%	100.0%

Self-source-Source

4.2.2 Evaluation of Assessment for PBDT in Tanzania:

The analysis based on the author's view in the evaluation studies available and the material gathered in the existing curriculum of bus driver training. The survey describes the respondent's opinion regarding the strengths and weaknesses associated with a training assessment used to evaluate trainee, as shown in table 18. Brock et al. (2007: p.12) explained that evaluation strategies used to analyse the performance and the effectiveness of learning methods after the learning process. The independent t-test measured the assessment opinion between male and female. The result was found no significant difference in score for female (M= 2.91, S.D=0.94) and male (M=2.73, S.D=0.89); t (71) =-0.62, p=0.535 95% CI (-0.77, 0.40) and the effect size (Cohen's d= 0.197).Dignath et al. (2008) using ANOVA reported the highest effect for interventions which combine the instruction of different type of strategies. An analysis of variance showed that the bus drivers opinion on expected benefit toward assessment of PBDT was significant, F (3, 68) = 4.07 p = 0.011. Also, the comparison between trainer and bus driver on the assessment's weakness was significant, F (2,107) =4.68, P= 0.011. The trainer responded to the assessment area, which leads to improving the bus driver training programme.

Table 18 Evaluation of assessment for PBDT in Tanzania

Variable	N	Mean	Std. Error	S.D
Method of assessing bus driver on PBDTs	73	2.75	0.105	0.894
Perception of an area of weakness on assessing trainee	110	2.08	0.113	1.186
Major area for assessment	26	3.58	0.305	1.554
The benefit of eco-driving for fleet companies.	141	2.18	0.088	1.039

Self-source, 2021

The results in Table 19 show the method of assessing professional drivers in Tanzania based on written and oral examination followed by practical training as part of the fulfilment of the learning process and combines techniques. Four items aggregated and recoded, and the results revealed 5% of trainer participants and the remaining percentage were 95% bus driver participated in the survey. Furthermore, 12% of participants assessed by written examination, 27 % followed by oral examination, the practical driving assessment was 38%, the combined method used to evaluations. Also, a Chi-square test of independence calculated to compare the association's frequency in assessing the training method between trainer and trainee (bus drivers). The result deployed to show that there is a significant different association between bus drivers and trainer on assessing training. The trainer uses the combined method to assess trainee while trainee(drivers could have the option of either written, practical or oral depending on the setup of trainers $\chi 2$ (9 (100) = 19.717, $p < .05$. In Europe, assessment drivers do not depend on approaches discussed in the literature review section 2.3.

Table 19 The existed assessing method of PBDT for bus drivers in Tanzania

Methods of evaluating bus driver on PBDTs (MA)		Professional		
		Trainer	Bus driver	Overall
Written examination	Count	2	10	12
	% within	15.0%	85.0%	100.0%
	% within PROFESSIONAL	42.9%	9.9%	12.0%
	% of Total	2.0%	10.0%	12.0%
Oral examination	Count	0	27	27
	% within (MA)	0.0%	100.0%	100.0%
	% within PROFESSIONAL	0.0%	42.9%	27.0%
	% of Total	0.0%	27.0%	27.0%
Practical driving assessment	Count	0	38	38
	% within MA	0.0%	100.0%	100.0%
	% within PROFESSIONAL	0.0%	39.6%	38.0%
	% of Total	0.0%	36.0%	38.0%
All above for assessment	Count	3	20	23
	% within MA	13.0%	87.0%	100.0%
	% within PROFESSIONAL	42.9%	22.0%	23.0%
	% of Total	3.0%	20.0%	23.0%
Total	Count	5	95	100
	% within (MA)	5.0%	95.0%	100.0%
	% within PROFESSIONAL	100.0%	100.0%	100.0%
	% of Total	5.0%	95.0%	100.0%

Self-source, 2021

4.3 The Traffic Regulation on Renewing the Bus Drivers' Licenses:

The author used the information from literature review, interviews, and survey to investigate the evidence bases on traffic regulation of renewing the bus driver licenses in Tanzania. The semi interview conducted with the LATRA officer explains additional information for the commercial driver regulation; for example, the participant said that "from 2019 when bus driver licenses expired should be attended to the professional driver training approximately after three years. Currently, they prepared the curriculum which will fit the training programme". In table 20 participant of indicated their conducts when their want renews the driver licences for the type of vehicle bus drivers in Tanzania. The total percentage score of participants suggests that 14.6 % of a school bus driver (SB), followed by Transits driver (TS) and bus rapid transits (BRT) with the same score 27% of their participants. Lastly, the long bus driver participants were highly in percentages about 35% willing to participate in training before renewing their licences. The driver who mentioned who paid only without training was 34.8%, of all participants who attended VETA were 44.9%. It showed that 12.4 % of participants participated in the VETA AND nit while NIT was only 4.5%, and remain who participants in only traffic driving test were

3.4 %. Other previous from SUMATRA indicated that most drivers in Tanzania trained to inform through relatives and in streets (SUMMATRA, 2017).

Table 20: Bus driver behaviour before renewing the driving licenses related to the training program

		BUS DRIVER				
Bus driver behaviour on renewing the driving licence(BRDL)		SB	TS	BRT	LD	Total
Paid for renewed license fee without bus driver training	Count	5	7	9	10	31
	% within BRDL	16.1%	22.6%	29.0%	32.3%	100.0%
	% within BUS DRIVER	38.5%	29.2%	37.5%	35.7%	34.8%
	% of Total	5.6%	7.9%	10.1%	11.2%	34.8%
After successful completion of bus driver training at VETA	Count	6	15	8	11	40
	% within BRDL	15.0%	37.5%	20.0%	27.5%	100.0%
	% within BUS DRIVER	46.2%	62.5%	33.3%	39.3%	44.9%
	% of Total	6.7%	16.9%	9.0%	12.4%	44.9%
Sit the official Traffic driving test	Count	1	0	2	0	3
	% within BRDL	33.3%	0.0%	66.7%	0.0%	100.0%
	% within BUS DRIVER	7.7%	0.0%	8.3%	0.0%	3.4%
	% of Total	1.1%	0.0%	2.2%	0.0%	3.4%
After successful completion of bus driver training at NIT	Count	0	2	2	0	4
	% within BRDL	0.0%	50.0%	50.0%	0.0%	100.0%
	% within BUS DRIVER	0.0%	8.3%	8.3%	0.0%	4.5%
	% of Total	0.0%	2.2%	2.2%	0.0%	4.5%
All the above	Count	1	0	3	7	11
	% within BRDL	9.1%	0.0%	27.3%	63.6%	100.0%
	% within BUS DRIVER	7.7%	0.0%	12.5%	25.0%	12.4%
	% of Total	1.1%	0.0%	3.4%	7.9%	12.4%
Total	Count	13	24	24	28	89
	% within BRDL	14.6%	27.0%	27.0%	31.5%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	14.6%	27.0%	27.0%	31.5%	100.0%

Self-source, 202

In the review of the study, traffic regulation ACT NO 3 OF 2019) of LATRA starts that “A certificate of authorization renewed every three years with proof of completing refresher training at a recognized institution in Tanzania. “This brings hope future it will be mandatory and reduces the accident and improves the skill of PBDs in Tanzania. Figure 7 describe the distribution of PBDs how they behave when wanted to renew driving licenses.

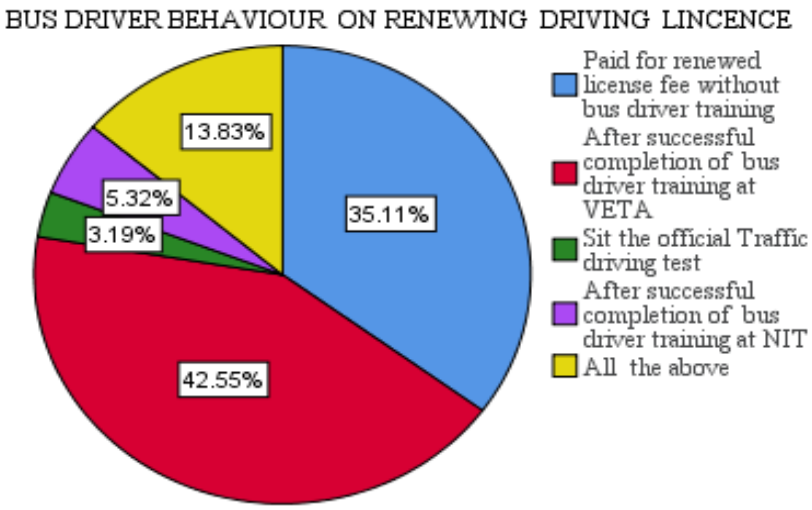


Figure 7: The analysis of bus driver behaviour on renewing the driving license. Self source,2021.

4.4 E-Learning Adoption Factor for Professional Drivers Training:

The general view on the eLearning adoption factor in Tanzania investigates via surveys and semi-structured from three trainers in NIT. The survey explores awareness, willingness/readiness, and perception toward using eLearning PBDs training and improving skill and safety. Also, invest aged the opinion on selecting devices that will be preferable to install (blended) eLearning tool. 66% of respondents were aware of eLearning, 31.4% of participants were highly willing to adopt eLearning, 24.8% thought that middle intention of willing to adopt eLearning, and 11% believed that they could not adopt eLearning. 26.8% of participants strongly agreed, 35.9%of participants agreed to adopt eLearning for PBDS for training. In comparison, 5.5% of participants did not agree with training toward improving the skill and traffic safety. table 21 below show the summary of the survey result. The interview discussed the subsection based on readiness driver school (NIT) and staff (trainers).

Table 21: Survey factor for adoption of (blended) eLearning for PBDT

VARIABLE S	N	Mean	S. D
Awareness Of E-Learning	152	1.66	0.47
Willingness/Readiness To Adopt ELearning For PBDT	103	4.26	0.83
Selection of Devices For E-Learning (Easy To Use) Tool	104	2.19	1.16
Perception ELearning on improving road safety	105	1.76	0.80
The Benefit of Eco-Driving for fleet companies.	141	2.18	1.04

Self-source, 2021: S.D – Standard division

4.4.1 Proposed devices for (blended) eLearning tool:

The survey conducted for this research shows the respondent opinions for devices that will be easy to use in the PBDT Tanzania. In addition, the survey suggests the devices which respondents were required to select, such as smartphone, computer (laptop), tablet and desk. The distractive statistical data show that 39.4 % (N=41) of respondents decided smartphone, followed by computers 23.1 %(N=24) while the lowest selection was desktop 16.3(N=17) of the respondent as shown in figure 8. The previous study suggested that wireless training, sometimes called 'm-learning,' for mobile learning, transported anywhere with a personal digital assistant (or 'PDA'; Polivka, 2001).

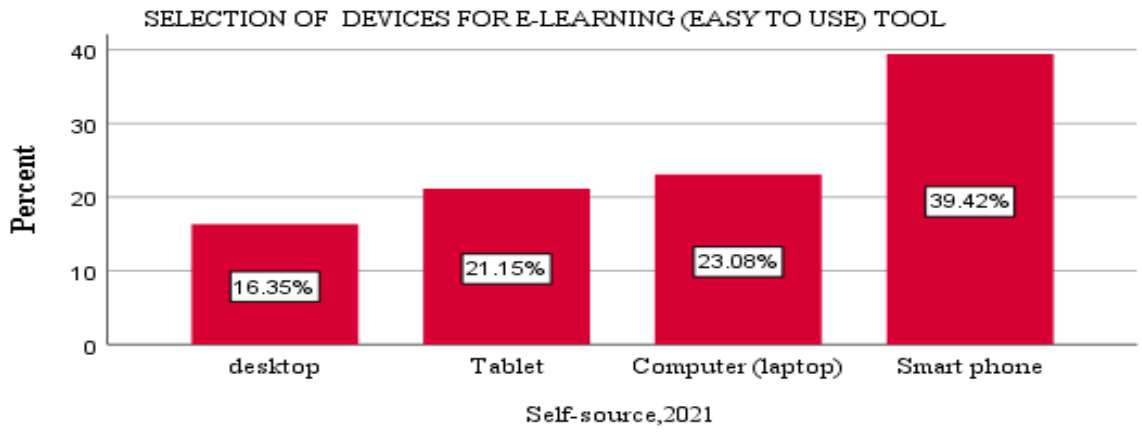


Figure 8; the opinion of respondents on a selection of eLearning tool devices.

However, one way ANOVA showed that bus drivers opinion on the selection of devices for eLearning tool (app. Web platform): in desktop, tablet, computer(laptop) and smartphone to professional bus driver training programme, the mean difference was not significant, $F(3, 59) = 2.36$, $p = 0.079$. Thus, it means that all these devices incorporated as part of training on eLearning. Also, Brock et al. (2007: p.17) describe how in the United States of America, trainee preferred to use video game personal computers, automated teller machines, cell phones, and various television recording and playing devices relevant to this study perspective easy to use the domain. Table 22 show the opinion for the adoption of eLearning in TBDT.

Table 22: Willingness/Readiness to Adopt ELearning (Blended) for PBDT

Opinion /readiness to adopt E-learning(BLENDED) for PBDT WL		BUS DRIVER				
		SB	TS	BRT	LD	Total
Very bad	Count	2	0	0	0	2
	% within WL	100.0%	0.0%	0.0%	0.0%	100.0%
	% within BUS DRIVER	22.2%	0.0%	0.0%	0.0%	3.2%
	% of Total	3.2%	0.0%	0.0%	0.0%	3.2%
Bad	Count	1	3	1	2	7
	% within WL	14.3%	42.9%	14.3%	28.6%	100.0%
	% within BUS DRIVER	11.1%	18.8%	6.7%	9.1%	11.3%
	% of Total	1.6%	4.8%	1.6%	3.2%	11.3%
Good	Count	2	7	5	8	22
	% within WL	9.1%	31.8%	22.7%	36.4%	100.0%
	% within BUS DRIVER	22.2%	43.8%	33.3%	36.4%	35.5%
	% of Total	3.2%	11.3%	8.1%	12.9%	35.5%
Very good	Count	4	6	9	12	31
	% within WL	12.9%	19.4%	29.0%	38.7%	100.0%
	% within BUS DRIVER	44.4%	37.5%	60.0%	54.5%	50.0%
	% of Total	6.5%	9.7%	14.5%	19.4%	50.0%
Total	Count	9	16	15	22	62
	% within WL	14.5%	25.8%	24.2%	35.5%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	14.5%	25.8%	24.2%	35.5%	100.0%

Self–source, 2021

4.4.2 Stakeholders' opinion to adopt eLearning and its implementation:

Before developing the eLearning, stakeholder identification based on influence and interest in their domain is necessary for a successful project's goals and purpose. L.J. Romero et al. (2013:3-4) explained that two types of stakeholder should consider internal and external. For example, internal stakeholders in this study are student (bus drivers), trainees, and bus driver school managers. On the other hand, external stakeholders such as fleet company, Government transport safety regulation and the ministry of transport affect the project's development if they are interested. In addition to that, the semi-structured interviews conducted with four organisations: NIT, the Bus driver association, and LATRA.The general overview from the interview for all stakeholders toward readiness to adopt eLearning was a positive reaction. Most of the interviewees proved their opinion on how eLearning will improve the knowledge and skill of road safety: the stakeholder view appropriated for e-learning tool development considered to construct the eLearning platform tool and themes. NIT and LATRA were very interested and showed the efficacy of adopting the eLearning (blended) method. NIT will use it for the learning process while the LATRA measures bus drivers' performance on assessing driver behaviour before certified the commercial driver licence. Thus, it integrates to exist technology tool GPS tracking tool (Telematics). To be specific, the table shows the stakeholder opinions for the adoption of eLearning. This approach has adopted from a study done by L.J. Romero et al. (2013:3-4).

Table 23: stakeholder description to influence the adoption of eLearning for PBDT

DIM	Internal Dimension			External Dimensions
Criterion	Bus drivers schools	Inter-organization	E-learning	
Functional	-Learning method -Course plan -Course planning acceptance by bus driver regulators -Content design and production	-The view collected between Driving school(NIT) and driver regulator (LATRA) - The drivers driving association (UWAMATA)	-Distance bus driver training and Education -eLearning course plans acceptance by driver regulator	-The common values between bus driver's school and regulator. (interchange experience)
Scope of study	-Dar es salaam -Driving school (NIT)	Bus drive school	-eLearning area of adoption and influence -Bus driver training staff of eLearning	Government agency (LATRA)
Knowledge/ capability	-Trainer staff of NIT -Content designers -IST department employee -Lectures staff of NIT -Technical Assessors (telecommunication)	Scholars, advisor from driver regulators	- driver trainers -content designers -system trainer -Technicians	-Research supersavers and promotors. -IST experts -National laws.
Hierarchical level	-Top management of NIT include rectors, head of the department of TFS. Bus driver trainer hierarchical level. Senior and journey driver trainers.	-Ministry of Works and transportation -LATRA -TCRA -bus driver association (UWAMATA)	-The general review themes and eLearning tool to be developed based on an opinion from NIT, UWAMATA and LATRA.	-Ministry hierarchy -LATRA and TCRA

Self-source, 2021; DIM- dimension

Moreover, the head of the department of transport of LATRA explained their future bus driver intervention. They expect to use a digital platform for an awareness campaign to commercial driver included bus drivers, when the author interviewed were already registered online 2,500. However, the

Trainer driver expert insisted the training should be user friendly to both driver and trainer with interactive features. In addition, they said the building capacity is necessary for trainers after developing the tool to ensure sustainability. One participant interviewed said they are using social media like WhatsUp for group discussion, and most many drivers are more active, which is suitable for easy adoption of the tool. They suggested that for beginning to be effective, the intervention should start with a small group of as experiment group of the project. Previous research from Europe and America supports this argument as a relevant factor to consider during training tool development (Ariane D.2018; RACV, 2016:4-6; i-DREAMS, 2020; Brock et al., 2007).

Furthermore, Table 23 summarises all stakeholders' external and internal dimensions on their significant role influence to adopt the eLearning. Bus driver as end-user presented by chairman of commercial driver association (UWAMATA) during the interview and other few drivers interviewed. The main concern was that the bus driver training system is still weak on driver training. After achieving the training programme, bus driver evaluation is still lacking, and the recognition of professional driver is lower in fleet companies. They suggest that the learning system should develop a mechanism of evaluation performance of drivers after study at least three months; their argument aligned to LATRA and NIT. Developed countries are popular on this postgraduate licence system for novice's learner (RACV, 2016; ProfDRV project (2011), and Panteia, 2014). The external dimension play role of environment support in term of the regulation policy and telecommunication services.

4.4.3 The Evaluation of Impact of eLearning to the PBDT:

The main objective of developing the eLearning tool was to improve the knowledge and skill of bus drivers in Tanzania. The study uses literature review, interview, and surveys to investigate the measure used to assess the trainee. Start with literature as explained already, the best practices shows that the driver behaviour some of the destructive behaviours can be change via technology tool. IDREAMS (2020) demonstrated the importance of using technology like telematics tool on behaviour intervention of the bus driver. Thus nearly similar to the existing intervention speed management tool of LATRA started in 2017, the head of the department of LATRA said it had reduced the accident rate. There is an ongoing research project which aimed to develop methods of reducing traffic crashes. According to the interviewee, this study tailed with research on enhancing the professionalism of bus drivers. However, the formative evaluation will be relevant to developing the eLearning tool. At the same time, the summative assessment used to measure the outcome of a trainee, as previously described by Lonero and Clinton 2006, p. 50).

The survey results show the relationship of variables relevant to the effective implementation of eLearning based on existing challenges shown in table 24 and 25. The results in Table 24 show bus driver participants the perception of e-learning on improving road based on the Likert scale(see Strong degree, disagree, Agree, and strongly agree). Four items recorded, and the results revealed 4.6% of bus driver participants strongly disagreed. The participants who think will improve safety by indicating agree 49.2%, and lastly, those who strongly agree 41.5% of bus driver participated in the survey. In general, participants' perception highly decided on the positive way of adopting eLearning will improve road safety. The long-distance bus driver highly scored a percentage of 35.4%, followed by transit bus drivers (daladala) at 26.2%. All of them their works schedule are irregular maybe they think will be an alternative to learning. On the other hand, bus rapid transit scored 23.1%, followed by 15.4% school bus participants, thus bring the picture that for formal bus driver employed, their thought slighted differed with inform bus drivers.

Table 24; the description of Perception Elearning on Improving Road Safety

Perception Elearning on Improving Road Safety(PE)		Bus driver SB	TS	BRT	LD	Overall
Strongly disagree	Count	0	0	2	1	3
	% within PE	0.0%	0.0%	66.7%	33.3%	100.0%
	% within BUS DRIVER	0.0%	0.0%	13.3%	4.3%	4.6%
	% of Total	0.0%	0.0%	3.1%	1.5%	4.6%
Disagree	Count	0	0	3	0	3
	% within PE	0.0%	0.0%	100.0%	0.0%	100.0%
	% within BUS DRIVER	0.0%	0.0%	20.0%	0.0%	4.6%
	% of Total	0.0%	0.0%	4.6%	0.0%	4.6%
Agree	Count	4	10	6	12	32
	% within PE	12.5%	31.3%	18.8%	37.5%	100.0%
	% within BUS DRIVER	40.0%	58.8%	40.0%	52.2%	49.2%
	% of Total	6.2%	15.4%	9.2%	18.5%	49.2%
Strongly agree	Count	6	7	4	10	27
	% within PE	22.2%	25.9%	14.8%	37.0%	100.0%
	% within BUS DRIVER	60.0%	41.2%	26.7%	43.5%	41.5%
	% of Total	9.2%	10.8%	6.2%	15.4%	41.5%
Total	Count	10	17	15	23	65
	% within PE	15.4%	26.2%	23.1%	35.4%	100.0%
	% within BUS DRIVER	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	15.4%	26.2%	23.1%	35.4%	100.0%

Self-source,2021

The interpretation of table 25 items; Q11- bus driver behaviour on renewing a driving license, Q12-training theory hours, Q17-willingness/readiness to adopt eLearning (blended), Q23- an area of weakness on assessing trainee, Q24 –a primary area of assessment, Q25-the benefit of ECO-driving for the fleet company and Q26 - expected benefit toward PBDT.

In this study, multiple correlation coefficients used to examine the relation between Professional bus drivers and their willingness to adopt PDDT incorporated with eLearning in Tanzania. Since there ordered categorical variables, Spearman correlation coefficient (r) deployed to verify the correlation between variables. Table 24 shows the relation between driver's behaviour toward eLearning, driver's background information, and training benefit. As presumed, bus driver behaviour on renewing driving license when attended to the training will be easy to adopt the eLearning. The advantage of driver training can influence the driver to engage in driver training. The existing weakness in assessing trainees can negatively affect bus drivers to attend the periodic training.

Table 25: Pearson Correlation Correlations among significant variables and total score

Pearson Correlation	1	2	3	4	5	6	7	total scores
Q11	1							
Q12	.331**	1						
Q17	.110	.120						
Q24	.616	.315	.081	1				
Q25	-.135	-.077	-.197*	.115	1			
Q23	.162	.322**	.063	-.143	.105	1		
Q26	.196	.298**	.122	-.008	.045	.915**	1	
total score	.541**	.603**	.242*	.545**	.326**	.792**	.797**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Self source,2021

The result of survey analysis by correlation test proved the assumption made that the positive behaviours of drivers were correlated positively with willingness/readiness to adopt the eLearning, eco-driving training and expected benefits of toward the professional bus drivers training. On the other side, the trainer's assessment area correlated with weakness in assessing the trainee. The advantage of ECO-driving for the fleet company and the expected benefit toward PBDT means that the practical assessment of training materials will positively impact training in real life. Also, figure 9 shows the impact of assessing the PbDTs in Tanzania. The previous study stated that the assessment for driver school has effects on knowledge and skills (TRAINER, 2003).

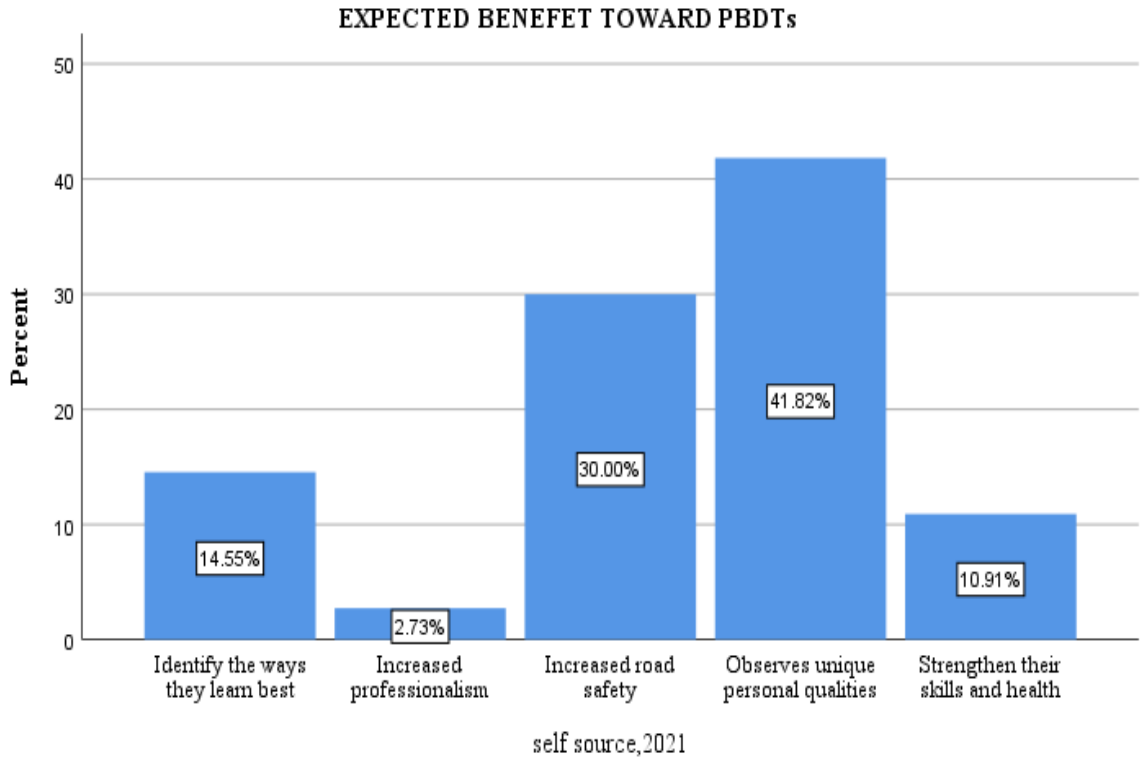


Figure 9; the impact of assessing the PBDT for bus drivers in Tanzania

CHAPTER 5 DEVELOPMENT PBDT PROGRAMME CONTENTS FOR ELEARNING:

The results from the survey illustrate the acceptance of (blended) eLearning for PBDT. A combined (e-learning) training programme will consist of eLearning training materials for the professional bus driver, e-learning supervisors and mentoring group facilitators, and an evaluation system. Throughout the design process, the learning and testing material contents developed: The primary learning goal, objectives and sub-objectives, the sequence of events, and a learning/testing strategy(. Its specialization and experience ensure developing a competitive training package, combining theoretical knowledge with practical activities. This study adopts the European CIECA-RUE Road User Education Project (2014) model framework for professional drivers. Aspects of lifelong learning in connection with the claims of the five levels of GDE-Matrix and an individual maintaining and developing driving competencies play a critical role for safe and responsible driving over a lifetime shown in figure 10 below.

As shown in table 17, the survey respondents identified five types of skills training: (1) customer services training, (2) defensive driver training, (3) fuel efficiency, (4) prevention injures and (5) health and ergonomic. Previous research reveals that "Health, well-being, lifestyle, attitude, knowledge, and hazard perception, attention to detail, hand-eye coordination, concentration, anticipation and observation are all important" (Murray, 2009). Also, the majority of respondents showed their interest in using mobile phones for learning. Therefore, during the development of the tool, significant attention should be on smartphones, computers, and tablets due to respondents' results. The proposed model will be developed with a broadband-based version of e-learning media to deliver the training, testing, and instructional materials. The training should involve the e-learning supervisors and the group discussion facilitators. General ICT skills; how to use eLearning 'tools': devices (phones/tablets etc.), enabling software (Zoom, Google classroom, etc.) and apps (WhatsApp, Facebook, YouTube etc.) driver trainer trained. The computer-based administrative capabilities required to facilitate bus driver trainees on registration, progress tracking, recording, support statistics, quiz responses (such as frequency that each question incorrectly answered, target where improvements are needed), etc.

5.1 Building E-Learning Module:

Development of training modules for periodic professional bus driver curriculum will base on competencies in the GDE-matrix, particularly level four and five (5PRO for professionals and their organisational environment). EU Directive 2003/59/EC referred to GDE-matrix as a guiding instrument to determine and structure the competencies to adequate knowledge and road safety skills (ETSC, 2010). However, improvements in driver training achieved in the longer term by concentrating on cognitive and perceptual skills, together with a greater emphasis on how factors such as beliefs and motivation shape driver behaviour (RACV, 2001). In addition, the technology-based training programmes can give participant's exposure to risky scenarios that they may otherwise rarely face on-road in a safe environment. Thus, training lessons supported by multimedia tools: PowerPoint presentations, films, photos, and clips work on and smartphones, tablet and PCs. The figure below shows the five modules proposed for periodic professional bus driver training in Tanzania.

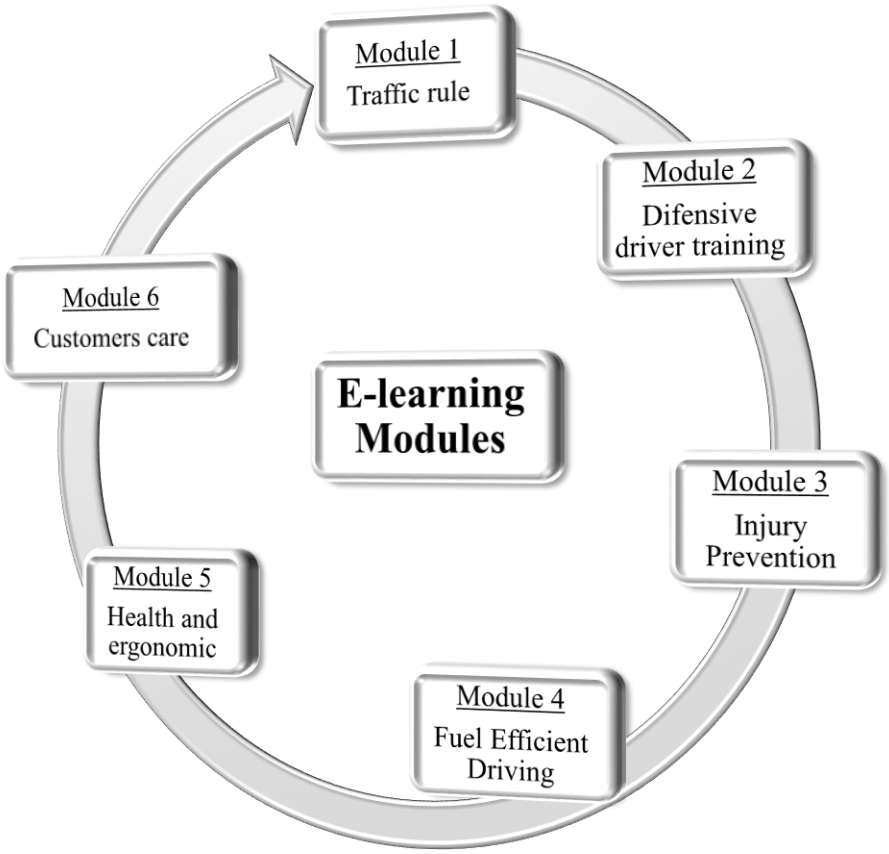


Figure 10. Proposed eLearning modules for PBDT in Tanzania.
(Source self-sourced, 2021)

5.2 Traffic Rule:

5.2.1 Introduction:

This module aims to introduce trainees to the existing traffic regulations in Tanzania that applied to a bus driver. In addition, the module will outline the licensing requirements and legal responsibilities of a bus driver. The training expected to raise awareness of the laws governing public transportation on the road. This module will have a series of submodules (30 to 60 minutes per each completed through eLearning application: The whole package in table 26.)

5.2.2 General Learning Outcome:

- Understand road traffic acts
- Understand the regulations that govern driving on public roads and highways in Tanzania.
- Observed warning and regulatory signs, Road Markings and traffic lights
- Understand their roles and responsibilities as professional drivers
- Understand the requirements and process of obtaining a bus driver’s license in Tanzania.

Table 26: Description of the module I course content Traffic Rule

Learning Environment					
(Blended) eLearning		In-yard		In- Vehicle	Total
Deliver (lecture, pairs, group, demo etc.)	**Assess** (show, do, quiz, test etc.)	**Observe** Trainer (watching Instruction)	**Apply** (Practice, Performance, etc.)	On-Road (Driving along)	
4 hours	30 minutes				4.30 Hours
Training Techniques					
Habits of Minds		Knowledge and Understanding		Skill and Processes	
-Recognized the impact of traffic laws convictions on working company -Recognize their roles and Responsibilities as professional drivers. Recognize road Markings and traffic lights		-Know the requirements and process of obtaining bus licenses. -Know the regulations that govern driving on public roads and highways in Tanzania. -Know the type of vehicles a bus driver's license holder can operate. -Comply with informative and additional plates/ supplementary signs		-Identify other laws, rules and regulations that apply to the road transport sector -warning and regulatory signs - Demonstrate compliance with give way and priority Signs. - Demonstrate compliance with prohibitory signs	

Source: This module content adopted from initiation qualified professional bus curriculum of East Africa (2015 pg.10, 11), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019 pg.19-26).

5.2.3 A Sample of Designed Submodule1 for eLearning Application:

The module of traffic rule comprises series of module1, which prepared by the trainer based on targeted bus driver trainee. The submodule1 Driving license requirements.

- **Introduction**

The lesson aims to provide knowledge of public services license by providing renewing the driving licenses. Also, to demonstrate driving license categories for commercial bus drivers. This lesson will increase the awareness of participant on the importance of getting train before renewed the licenses.

- **Legal requirements for bus driving**

  The bus driver will learn legal requirements when driving a commercial vehicle in Tanzania. Thus, include information on having a proper licence and insurance. They must teach about the importance of obeying traffic laws and regulations. It involves providing the learner with information on:

a) *The public services license category*

› **C License** to drive public service vehicles with a seating capacity of 30 and more passengers in addition to the driver, Vehicles in this category combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held Class CI or E license for not less than three years.

› **C1 License** to drive public service vehicles with a seating capacity of 15 but less than 30 passengers in addition to the driver. Light-duty cars in this category combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held a Class D license for not less than three years.
› **C2 License** to drive public service vehicles with seating of four but less than fifteen Passengers. Light duty vehicle in this category combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held a Class D license for not less than three years.
› **C3 License** to drive public services vehicles with a seating capacity of four or fewer passengers, inclusive of the driver: Vehicles in this category combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held a Class D license for not less than three years.
› Commercial Light-Duty Vehicles
› **D License** to drive all types of vehicles, heavy-duty and public service vehicles.
› Commercial Heavy-Duty Vehicles
› **E License** to drive all types of vehicles except motorcycles and public service vehicles. Applicants must have held Class D License for not less than three years

b) The procedure of renewing the bus driving licenses

PSV driving license holders are required to undergo a refresher course before resuming their documents. The following are the requirements to obtain a PSV driver's license in Tanzania.

- After successful completion of this course, trainees must complete an enhanced knowledge test at NIT or VETA in Tanzania
- To participate in the test, trainees must present a copy of the course completion form from NIT or VETA.
- After successful completion of the knowledge test, trainees can schedule their Class 2-S road test.
- Road tests conducted by Traffic police examiners Driver Examiners
- The road test will include the following components; the pre-trip inspection, backing manoeuvers and the behind-the-wheel tests; road test clients provide required a bus with a seating capacity exceeding 24 passengers, excluding the driver for a road test.
- Applying the driving licenses to TRA and then for professional bus drivers, they must apply to LATRA a commercial driving certificate. Table 27 shown below the importance of driver training, the LATRA and traffic police intervention on reducing traffic accidents
- Figure 11 shows the layout of a certified commercial vehicle driver card by LATRA.

Table 27: The traffic road accident report of 2011 to 2020 in Tanzania

Event	Year		Deference	Percentage (%)
	2011-2015	2016-2020		
Traffic crashes	94,103	23,584	-70519	-75
Injuries	85,515	23,153	-62362	-46
Death	19,180	10,334	-8846	-73

Source: National traffic police (BIGRS 2015 – 2019).

(Made under Regulation 8(2))

DRIVER'S CERTIFICATE OF AUTHORIZATION

(Made Under Regulation 8(1))

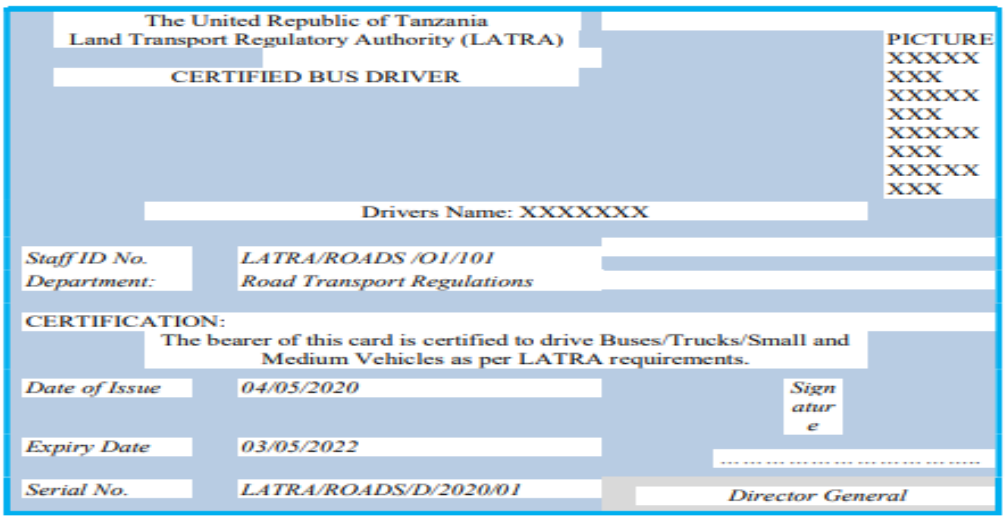


Figure 11: Example of commercial driver certificate from LATRA

c) Suspension or cancellation of certificate of authorization

Bus driver trainee should understand the traffic regulation that could suspend or cancel the driving license and certificate of commercial bus drivers**.** According to the LATRA act (CAP.413), regulation section45:14(2). The revoking a certificate of authorization under the following conditions

- if a driver undergoes two suspensions within a validity period of the certificate of approval;
- if a driver causes an accident resulting in serious injuries or death through careless or reckless driving;
- upon proof of tempering with vehicle tracking system or fare charging system;
- upon evidence of driving while under the influence of alcohol or drugs;
- upon conviction concerning offences against passengers or their properties;

Suspend for three months certificate of authorization of the driver whose demerits point's decreases to ten or below as shown annexe 4.

Related tasks (QUIZ)

- Explain the procedures for applying for a driving licence
- Mention consequences of driving while disqualified or without a driving license
- Explain the significances of attending a training course before operating a motor vehicle
- How do you categories of public service driving licenses?

5.3 Module: 2 Defensive Drive Training:

5.3.1 Introduction:

A defensive driver training course teaches designed safe driving techniques and instils responsible driving habits in drivers. It goes beyond mastery of the rules of the road and the basic mechanics of driving (NET, 2016). The driver's skills, knowledge, habits, attitudes, physical and mental condition

are significant factors in a collision involving or avoiding one. A device like telematics and roadRISK tool ca as part of uses lesson shown in table 28.

5.3.2 *General Learning Outcomes:*

At the end of this module, the trainees should be able to:

- Identify the causes of road crashes and their consequences
- Understand defensive driving principles.
- Recognize everyday situations that lead to collisions
- Understand that personal attitudes and defensive driving habits are crucial to preventing Collisions.

Table 28 Description of module 2 course content of defensive training

Learning Environment					
(Blended) eLearning		In-yard		In- Vehicle	Total
Deliver (lecture, pairs, group, demo etc.)	**Assess** (show, do, quiz, test etc.)	**Observe** Trainer (watching Instruction)	**Apply** (Practice Performance etc.)	**On-Road** (Driving along)	
2.30 hours	30minutes			6 hours	9 hours
Training Techniques (trainee will)					
Habits of Minds		Knowledge and Understanding		Skill and Processes	
Appreciate the importance of defensive and proactive driving habits Recognise road hazards Appreciate the concept of "connecting the mind with the eyes" when operating the vehicle. Recognize the impact of distracted and impaired driving on traffic safety. Recognize their duty of care to protect other road users from harm proactively Use the information gained by observation to form a driving plan		Know the importance of responsible driving Understand the concept of defensive driving. Know and understand the elements of defensive driving Know the steps for avoiding hazards. Know and understand the six conditions affecting driving Apply the standard Accident Prevention Formula for safe driving. Know and understand the potential causes for two-vehicle collisions and the procedures for avoiding them.		Demonstrate an understanding of the Zone awareness Detect and interpret clues in the zone of awareness Demonstrate good visual habits by dealing with blind spots, including those caused by mirrors and where motorcycles and bicycles hidden Demonstrate an understanding of emergency driving techniques under differing road condition	

Source: This module content adopted from initiation qualified professional bus curriculum of East Africa (2015 pg.15-17), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019 pg.125-150) and (NET, 2016).

5.3.3 *Related task (Quizzes):*

a) Define a crash
b) Explain human errors as a significant road crash causation factor
c) Explain vehicle and environment as road crash causation factors
d) Explain static, mobile and variable hazards, a safe following distance.

e) Define the Accident Prevention Formula and demonstrate the use of the Accident Prevention Formula.
f) Explain the purpose of the Highway Code and the primary use of motor vehicle signals

5.4 Module 3 Injury Prevention:

5.4.1 *I*ntroduction:

Professional bus drivers have more injuries that keep them off the job than workers in any other industry. The primary traffic source of injures is unsafe acts, unsafe conditions, errors in judgment, or environmental dangers of those injuries. This course designed to provide drivers with information that can help them prevent while on and off the road. After completing this course, learners will recognize everyday activities that put them at risk for injury and protect themselves to stay on the job. Table 29 shows the whole package of the syllabus to the module.

General Learning Outcomes:

At the end of this module, the trainees should be able to:

•Understand how to handle minor emergency incidents in a professional manner
•Understand how to handle situations where they are involved in a vehicle collision
•Understand how to handle fire incidents
•Understand how to manoeuvre the bus safely in the event of a mechanical breakdown

Table 29: Description of module 3 course content of injury prevention training

<table>
<tr><td colspan="6">Learning Environment</td></tr>
<tr><td colspan="2">(Blended) eLearning</td><td colspan="2">In-yard</td><td>In- Vehicle</td><td>Total</td></tr>
<tr><td>Deliver
(lecture, pairs group, demo etc.)</td><td>Assess
(show, do, quiz, test etc.)</td><td>Observe
Trainer (watching Instruction)</td><td>Apply
(Practice, Performance, etc.)</td><td>On-Road
(Driving along)</td><td></td></tr>
<tr><td>1.30 hours</td><td>30 minutes</td><td>45 minutes</td><td>1 hour</td><td></td><td>3.45 hours</td></tr>
<tr><td colspan="6">Training Techniques</td></tr>
<tr><td colspan="2">Habits of Minds</td><td colspan="2">Knowledge and Understanding</td><td colspan="2">Skill and Processes</td></tr>
<tr><td colspan="2">-Consider the safety of passengers as their primary concern
-Recognize the importance of remaining conscious and alert in emergencies
-Be prepared to take control in emergencies
-Understand the importance of remaining calm at all times
-Identify common causes of vehicle fires</td><td colspan="2">-Identify the risks at the scene of a crash or breakdown
-Identify actions to take in the event of a crash
-Interact appropriately with the authorities and other parties involved in the crash.
-Identify the type of safety equipment found on buses
-Understand when approved warning devices need deploying</td><td colspan="2">Prepare passengers for emergencies.
Organize bystanders to assist in bringing the collision scene under control
Demonstrate the correct procedure when using an approved warning device
Demonstrate the proper technique when using fire extinguishers.</td></tr>
</table>

Source: This module content adopted from initiation qualified professional bus curriculum of East Africa (2015 pg.24-25), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019 pg.240-250) and (ROSPA, 2018).

Related task (quiz)

a) Explain the risk to individuals at the scene of a crash or breakdown

b) Explain the actions to take to ensure the safety of individuals at the scene of a collision or breakdown
c) Check passengers and others involved for injuries and call for professional medical help if necessary.
d) Perform basic First Aid until professional medical help arrives
e) Explain the need to avoid any kind of argument with anyone involved in the crash
f) List and explain the consequences of a vehicle breakdown
g) Warn other road users (display warning triangles at an appropriate distance)

5.5 Module 4: Fuel Efficient Driving:

5.5.1 Introduction:

This course will raise your awareness of the environmental impact of emissions, fuel efficiency, cleaner vehicles and alternative fuel technologies. It will also demonstrate to you how to drive and operate your car in a fuel-efficient manner. Fuel efficient eco-driver training teaches employees to drive more economically, saving fleet fuel costs. It also helps to improve driving skills, which reduces insurance and vehicle costs**.** Monitoring and managing the fuel used by their vehicles is vital for a professional operator. A fleet's fuel consumption reduced by at least 5% by implementing a fuel management programme, with an equivalent cost-saving (SAFED, 2003). In addition, they are using less fuel when driving International Road Transport Union (IRU) has developed intelligent agent check advice on safe eco-driving to help drivers adjust their driving behaviour to different situations. As a result, Eco-driving can reduce fuel consumption, greenhouse gas emissions and accident rates adopted in Tanzania (IRU, 2020). Table 30 shows the whole package of the syllabus to the module.

5.5.2 General Learning Outcomes:

At the end of this module, the trainees should be able to:

- Be able to demonstrate an awareness of the critical principles of fuel-efficient driving
- Drive and operate in a fuel-efficient manner by decrease fuel consumption of public transport vehicles
- Help deliver significant fuel economy gains and a reduction in vehicle maintenance costs delivery.
- Identify types of road transport environmental Pollution
- Identify and manage the impact of road transport on the environment.

Related task

a) Explain how tyre condition, wheel alignment, fuel leaks, oil and coolant leaks, brakes, and streamlining affect fuel consumption.
b) Explain why double de-clutching increases vehicle engine wear and tear and reduces fuel Efficiency.
c) Explain the effects of air pollution on human health
d) Explain the benefits of new technology for the environment
e) Explain the benefits of energy-efficient vehicles on the environment
f) Explain the impact of air pollution on climate change

Table 30: Description of module 4 course content of fuel-efficient driving

Learning Environment					
(Blended) eLearning		In-yard		In- Vehicle	Total
Deliver (lecture, pairs, group, demo etc.)	**Assess** (show, do, quiz, test etc.)	**Observe** Trainer (watching Instruction)	**Apply** (Practice, Performance, etc.)	On-Road (Driving along)	
2.30 hours	30 minutes	30 minutes	1 hour	2.30 hours	7 hours
Training Techniques					
Habits of Minds		Knowledge and Understanding		Skill and Processes	
Anticipate situations and other road users as far ahead as possible to avoid unnecessary braking and acceleration. When slowing down or driving downhill, remain in gear but take your foot off the accelerator as early as possible Turn off your engine if you expect to be stationary for more than a minute or so. Avoid carrying dead weight as anything that adds to the importance of a vehicle will increase fuel consumption Keep the vehicle in good maintenance.		Maintain a greater distance from the vehicle in front to regulate vehicle speed when necessary without using the brakes. Understand how high speeds significantly increase fuel consumption. Know how to maintain a steady speed at a low RPM. Understand all ancillary loads, but particularly air conditioning, add to fuel consumption. Identify types of emissions produced by motor vehicles Identify the direct impact of road transport pollution		Check tyre pressures regularly and before long journeys; underinflated tyres create more rolling resistance and use more fuel. Use the correct specification of engine oil Keep windows shut at high speed Demonstrate the correct procedure when using fire extinguishers. Shift up as soon as possible: Shift up early gear between 2.000 and 2.500 revolutions per minutes	

Source: This module content adopted from the initiation qualified professional bus curriculum of East Africa (2015 pg.28). Energy Saving Trust Fuel-efficient driving techniques for your fleet, from London (2016 pg.2-6) and The Safe and Fuel Efficient Driving (SAFED) Standard (2003).

5.6 Module 5: Health and Ergonomic:

5.6.1 Introduction:

Driver ergonomics focuses on the health aspects of driving, drawing upon biology, psychology, engineering and design to create vehicle environments in which people have a lower chance of injury. The purpose of this module is to explain traffic legislations that regulate commercial drivers' hours of work and how to correctly record and maintain a daily log of driver activities in Tanzania and East Africa. Table 31 shows the whole package of the syllabus to the module.

5.6.2 General Learning Outcomes:

At the end of this module, trainees should:

- Have a good understanding of the Road traffic legislation for Hours of Service requirements
- Be knowledgeable in how to record and maintain a log of their hours of driving
- Have an understanding of driver and employer responsibilities regarding Hours of Service regulations
- Identify and provide important information about hazards in their workplaces.

Table 31: Description of module 5 course content of Health and ergonomic

Learning Environment					
(Blended) eLearning		In-yard		In- Vehicle	Total
Deliver (lecture, pairs, group, demo etc.)	**Assess** (show, do, quiz, test etc.)	**Observe** Trainer (watching Instruction)	**Apply** (Practice, Performance, etc.)	On-Road (Driving along)	
1.30 hours	30 minutes			2 hours	4. Hours
Training Techniques					
Habits of Minds		Knowledge and Understanding		Skill and Processes	
Recognize the importance of rest in collision avoidance Recognize the importance of keeping a daily log of on-duty activities. Recognize the importance of wearing safety belts (lap and shoulder). Recognize the fatigues management practices		Know the legislative hours of service for operating drivers. Know the information required in a logbook. Know the consequences of violating the hours of service regulation and tampering with a logbook Know to adjust headrest, seatbelt and mirrors.		Ability to complete a logbook. Demonstrate driving Posture in the vehicle. Demonstrate disturbance that affects the amount and quality of sleep; Avoid using coffee and other drugs.	

Source: This module content adopted from initiation qualified professional bus curriculum of East Africa (2015 pg.28), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019 pg.188-202).

Related task

- Does Driving make the driver ill?
- What does health mean to you?
- Explain the effects of emotional state on driving performance.
- How do you recognize the fatigues?

5.7 Module 6: Customer Services:

5.7.1 Introduction:

A professional bus driver has the main objective of ensuring passenger comfort and safety. Public transport companies are taking various initiatives to improve their customer care by upstanding their drivers' interpersonal skills. As part of customer service training, bus companies acknowledge that drivers are the company's face, and for passengers, the driver is often the only contact with the operating

company. This module aims to familiarize trainees with passenger management and general loading and unloading procedures. Table 32 shows the whole package of the syllabus to the module.

5.7.2 *General Learning Outcomes:*

At the end of this module, the trainees should be able to:

- Understand how to manage passengers and deliver compelling customer service
- Provide a professional service
- Understand the general passenger loading and unloading procedures
- Know the legal passenger loading limits and bus capacity
- Safely load, unload and transport passengers, including passengers with mobility devices.

Table 32: Description of module 6 course content customer care

Learning Environment					
(Blended) eLearning		In-yard		In- Vehicle	Total
Deliver (lecture, pairs, group, demo etc.)	**Assess** (show, do, quiz, test etc.)	**Observe** Trainer (watching Instruction)	**Apply** (Practice, Performance etc.)	On-Road (Driving along)	
2.30 hours	30minutes	20 minutes	40 Minutes		4hours
Training material					
Habits of Minds		Knowledge and Understanding		Skill and Processes	
Recognize the importance of Professionalism Value the three R's: right, respect and responsibility Recognize the importance of following procedure to keep passengers safe in all stages of the trip. Managing challenging situations		Understand the components of professionalism Know the three R's: right, respect and responsibility Understanding relevant legislation Know the procedures for loading and unloading passengers Communicate effectively with Customers.		Problem-solving – managing conflicting demands. Support customers in using your service. Meet the needs of customers Caring for their appearance Showing positive attitude	

Source: This module content adopted from initiation qualified professional bus curriculum of East Africa (2015 pg.22, 23), Commercial Bus and School Bus Driver Training Course (Class 2-S) from the government of Alberta, Canada (2019 pg.205-208) and Bus driver training what works? What next? (2015 pg.17-21).

5.7.3 *Related Tasks (Quizzes):*

a) Explain what good customer care and the benefit of a positive attitude is.
b) Explain the need to exercise care and consideration when carrying elderly or infirm customers.
c) How do you deal with difficult people, for example, your passengers, other road users, management, or another bus driver?
d) How do you handle complaints from passengers?
e) Do you know the element of driver conducts which improves customer services?
f) Explain how assisting passengers with luggage/goods not only demonstrates good customer care but also reduces delays.

All in all, After discussed the eLearning training contents, the next section will develop the prototype of learning. Table 33 describes the best practices for the learning process includes five steps;(1) think in big pictures(literature review and empirical-based); (2) Get the Assessment and Design Right; (3) Integrate the Essential eLearning Design;(4) Use an Engaging Training Model and (5) Plan for Evaluation. Thus, it highlighted the critical stage for developing the effective intervention of PBDT.

Table 33 Strategic concept matrix on to consider on developing eLearning for PBDT

No	The tools/conception on developing the bus driver training program				
	Who would use it?	Why do you would use it	How would you benefit	Why your employer/learners would care	Why your organization would care
1	bus drivers (Learning system)	to ensure the highest level (safety, fuel economy and health)	Bus drivers, driving school and fleet organization	Developed improves safety productivity	(organization Competitiveness and retaining the employee)
2	Instructional designers, as wells trainers,	effectively identified the need, learning objectives, and methods that most effective	The optimal learning experience for learners (E.g. bus drivers).	avoid loss of time consumption and resources (traffic crash and fuel consumption)	the organization set a high standard of engaging and quality training(e.g. Eco-driving, professionalism)
3	A bus driving school needs to reach a broad audience and deploy training and cost-effectively	E-Learning instructional design is a flexible and multiple locations, harmonization of training materials.	convenience & flexibility to learners(bus drivers); sharper focus on required knowledge and skill,	Online learning saves on travel, time out of the office, bus driver learning feedbacks	Well-designed and engaging e-learning will earn organization members satisfied customers and reviews for a fleet organization using gamification for feedback
4	trainers, designers, managers, and organizational development professionals	Training is consistent, engaging, and meets the highest standards of professionalism	benefit from a better-sequenced series of learning event	Ultimately learning will bring to the organization more excellent retention, learning transfer	The goal of every training effort is business impact. Increased training effectiveness will lead to better performance outcomes.
5	Bus driving School committee, safety fleet managers, trainers (NIT, LATRA)	This best practice is to track progress and measure success.	Developing the ability to measure and evaluate the impact of training and development programs	Guarantee employers and senior executives are interested in the impact of your programs (reduce accident)	Organizations need to make decisions on where to invest energy and efforts for the most significant impact. Implementing a sustainable evaluation

Self-source, 2021:Adopted from ASTD study for purposes of developing the eLearning for PBDT

CHAPTER 6 PROPOSED E-LEARNING PROTOTYPE FOR PBDT:

6.1 Introduction:

The eLearning contained six modules designed based on empirical analysis of this research as an eLearning package for professional drivers. The bus driver trainers must use each module to develop a submodule for eLearning, which takes at least 40 minutes to one hour. The assignment and quizzes are more critical for testing the knowledge and skill of the trainee. Due to the flexibility of eLearning training, the trainer can set a package of training based on client requirement as to how developing countries practices. Elearning prototype aims to gain insight into reducing traffic accidents and developing bus driver training package needed in the short and long term, considering developments in the fleet organization market in Tanzania and East Africa. As shown in Tables 23 and 33, the strategic matrix helps translate policy and tactic results into proposed prototype features concerning the simplicity and user-friendly interface.

6.2 Learning **management system**

Learning Management System (LMS) is software used in the learning process for delivering, tracking and managing training as defined by Park (2005). The trainer firstly installs software, creates course content packages and post, enrol/allow access to trainees, gives feedback from student's assignment and test, and then provides the course as automatic/ manually accessed. LMS allows for instructors/ bus driver and administrators to track attendance, time spent on tasks, and bus drive trainee progress. In addition, the trainer can give the only survey to the trainee to get feedback required on the course content and training method. PowerPoint with audio, video and integrated with other technology tools. The expected prototype to have a navigation protocol for trainers and trainee to accomplish tasks by having a smooth flow from one segment of a course to another. The best practices conducted in Europe under a project known as TRAINER as the abbreviation of title System for driver TRaining and Assessment using INteractive Evaluation tools and Reliable methodologies in 2013. Figure 12 show the structure of the proposed prototype of eLearning navigation. Trainees also must log in to the LMS to submit homework, access the modules and lessons, see the grades and print completion records in the form of certificates.

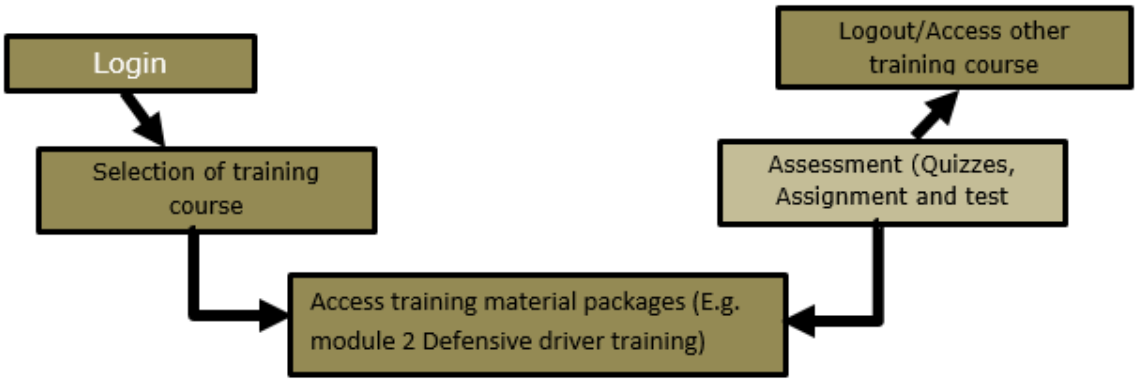


Figure 12: The structure of proposed the prototype of eLearning

After investigating the tool needed, the next step was to create the training material via PowerPoint for one module as a case study. Due to time constraints, it was challenging to communicate with the NIT department of eLearning to test the existing eLearning if it fit the driving training. However, the researcher accessed the trial version of software's knowns as spring suit ten used to test the model. The soft was free for 14 days before expired before the upgrade. The software met the essential requirement of the eLearning platform for professional drivers training. It possessed user-friendly interfaces,

supports trainer and trainee in learning for posting and access subtasks assigned by trainer. Due limit of time, the researcher managed to prepare modules and posted them to that software. It used the online PowerPoint version in the learning process and quizzes as gamification. The interface has two parts: one part user will be a trainer, and the other will be a trainee.

6.2.1 The Trainer's Interface for eLearning Platform:

Based on the trial version of the spring suit, the trainer can post the instruction information and course contents and create the PowerPoint quizzes. The feedback can be either from learner to trainers or trainer to the learner. The figure bellows shows the step to take to complete the course contents.

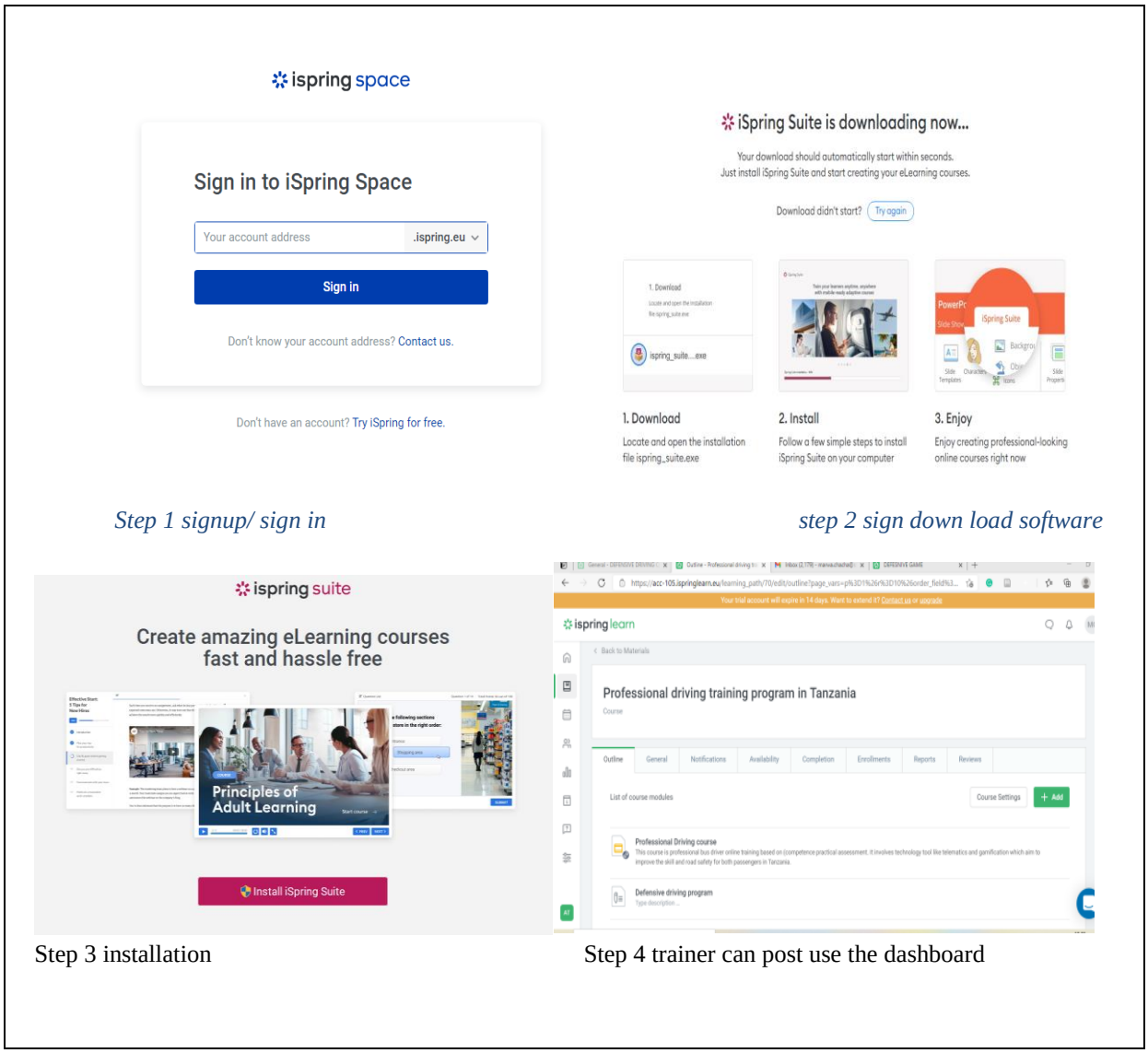
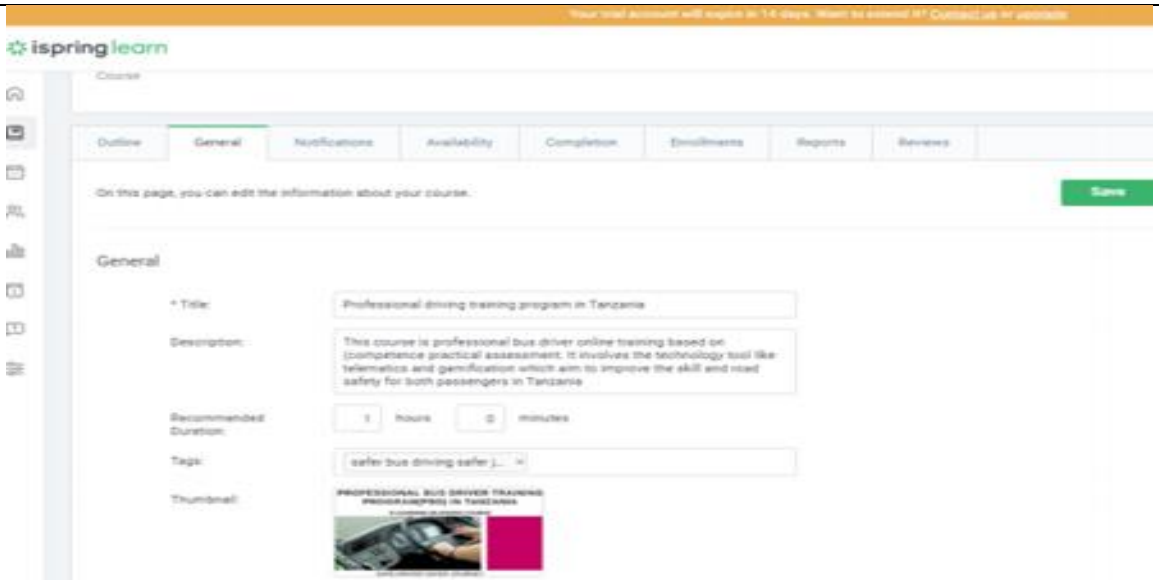
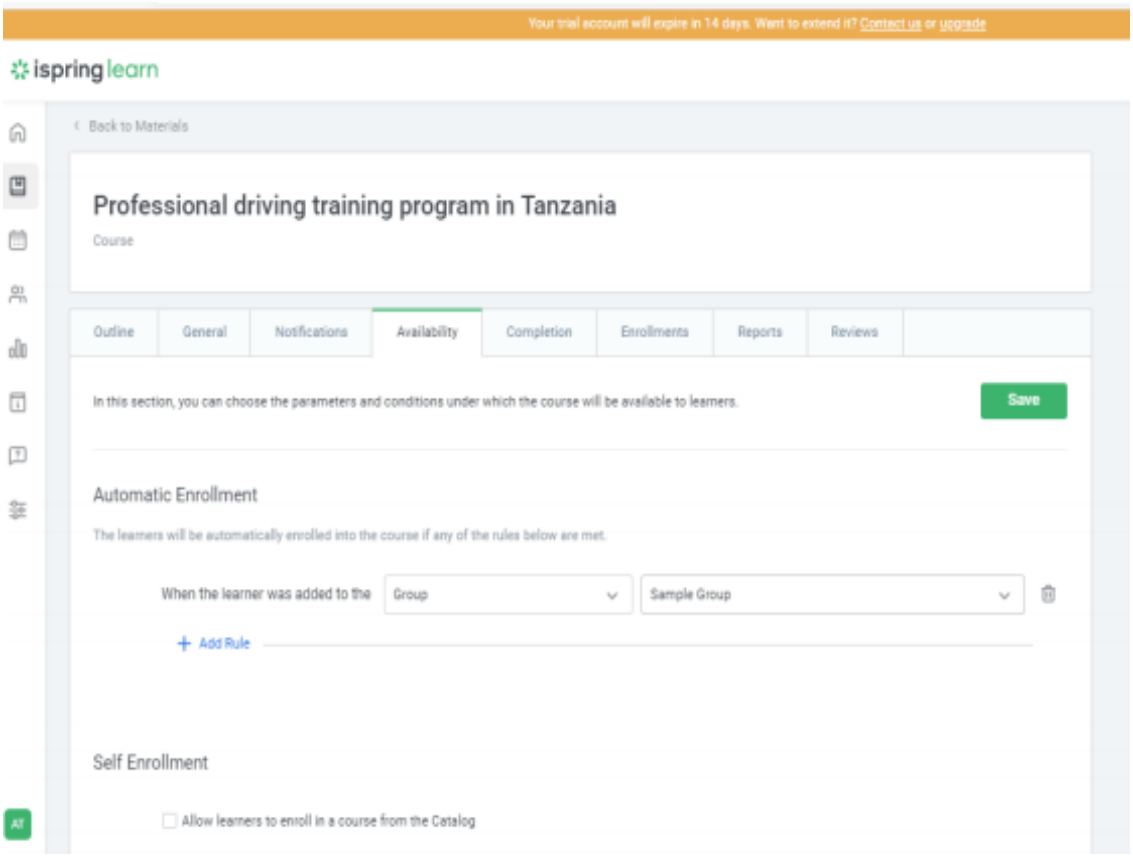


Figure 13; the figure shows steps one to steps 4 for trainer interfaces for the eLearning platform

The registration process as a trainer differs with the trainee; the trainer must install the software before starting using software with an authorized licence if it is not trial versions. While the trainee gets, only the link can operate without accessed installing the software. The trainer can use the PowerPoint software to develop the course contents, assignments, and quizzes for bus driver's trainees, as shown in Figures 14 and 15 below. Assessing learning in a prototype creates in the form of multiple-choice questions or other assessments that can be scored easily by a computer such as drag-and-drop, radio button, as shown in annexe 7. The instructor/trainer expected to set the grades for the presented assignment and quizzes to evaluate and check the study progress of the bus driver trainee.



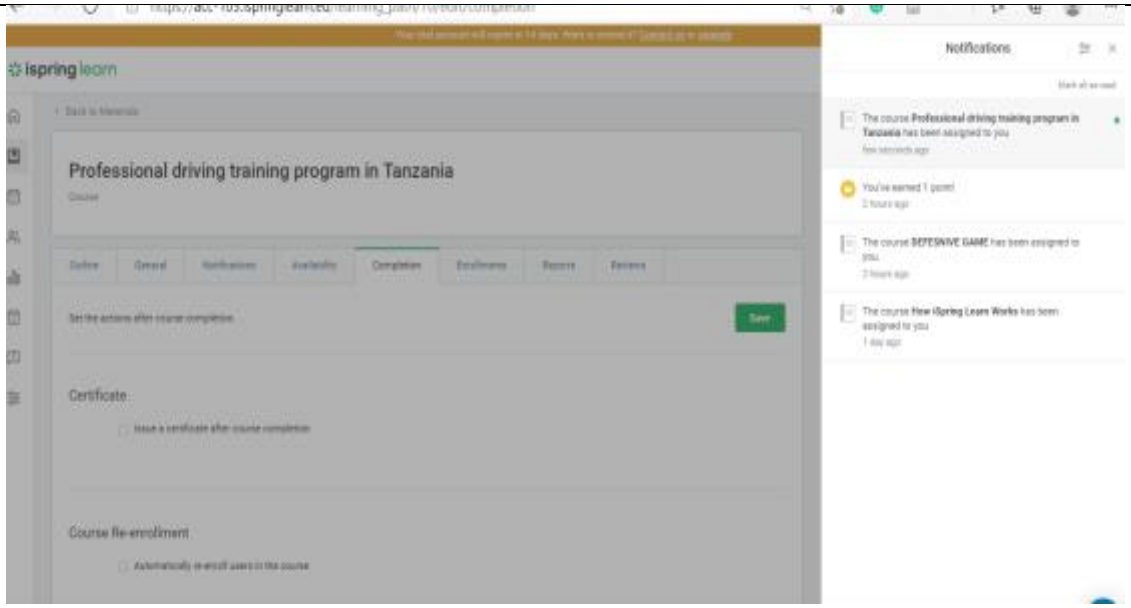
step5: trainer use interface to set the course content and assignment



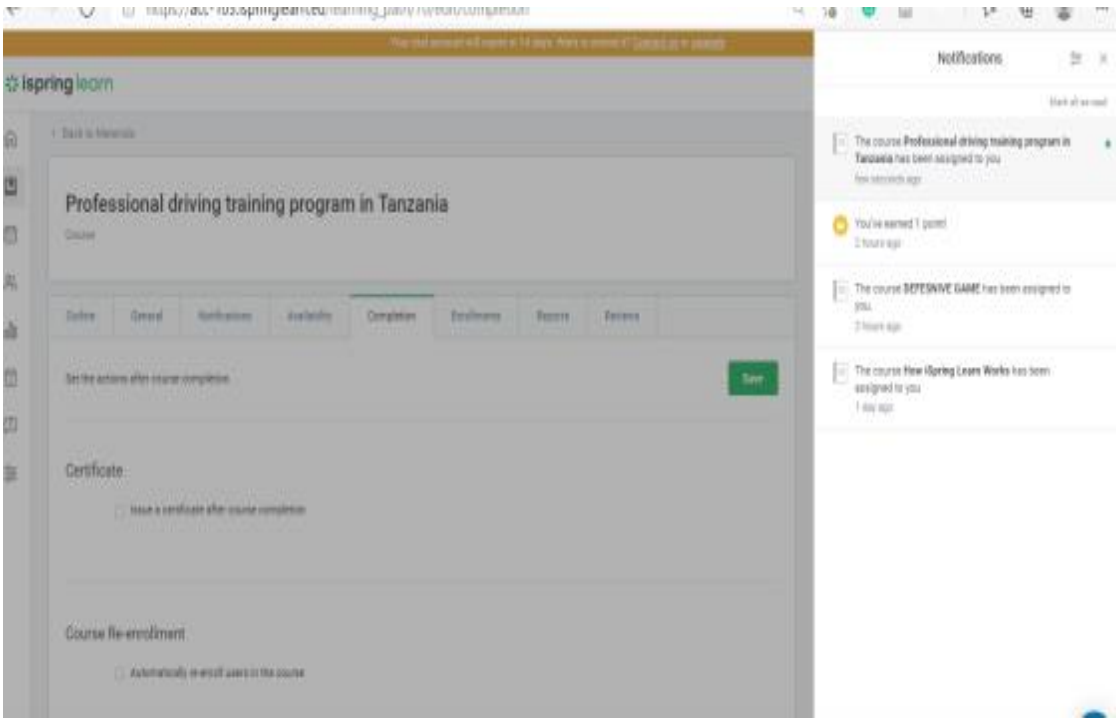
Step 6: the setup of automatic enrollment for trainee finished to payment of training fee.

Figure 14: step 5 and 6 for trainer and administrator officers navigation on the eLearning platform.

(self-constructed,2021)



step 7; Notification will be sent to driver training with a password in the course



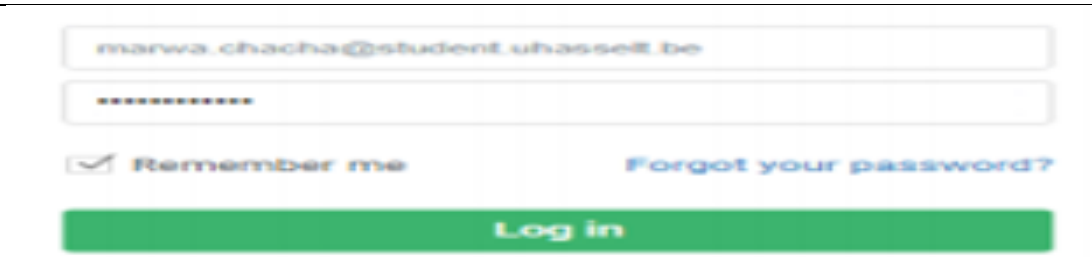
Step 8: Certificate can be controlled by administers offices regarding the nature of the course.

Figure 15: step 7 and 8 for trainer and administers officer navigation for certificate control.

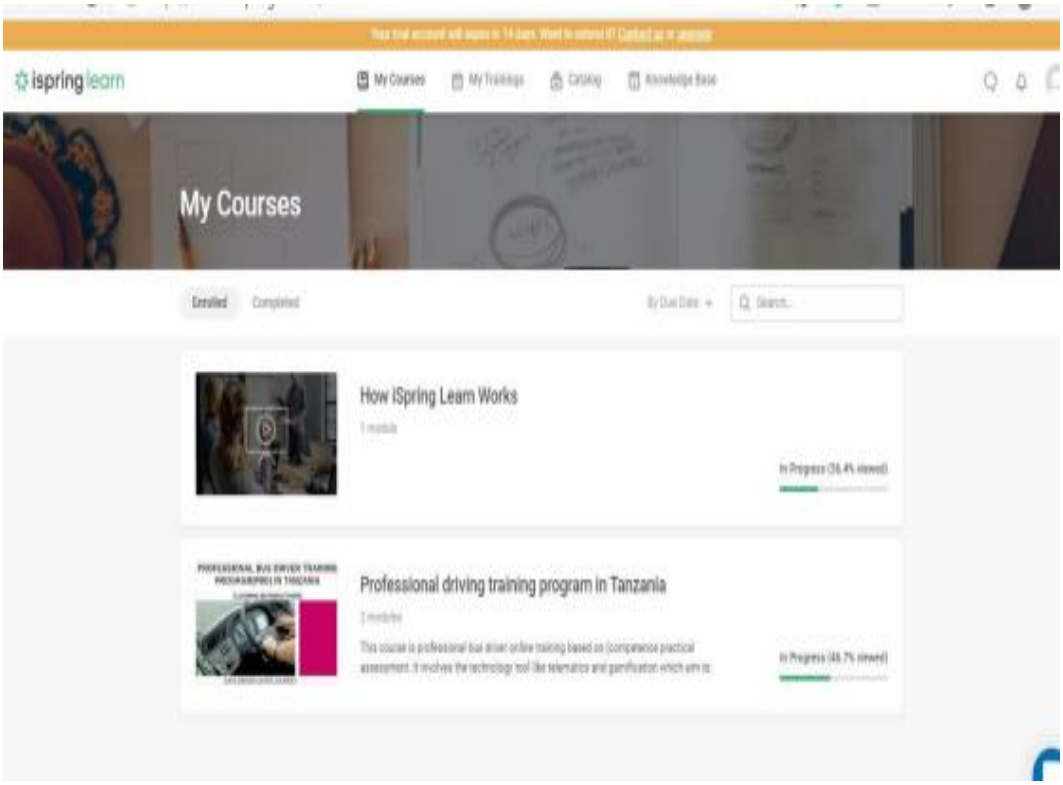
Source: (self-sourced, 2021)

*6.2.2 The Interface for Bus Drivers on eLearning Platform***:**

The interface to use for track driver trainee involves standard steps found in another platform like Facebook. First, the trainee uses the password sent to his or her email. The figures16 and 17 below are steps which guide trainee to access the course online/ eLearning course.



Step: 1 Sign in



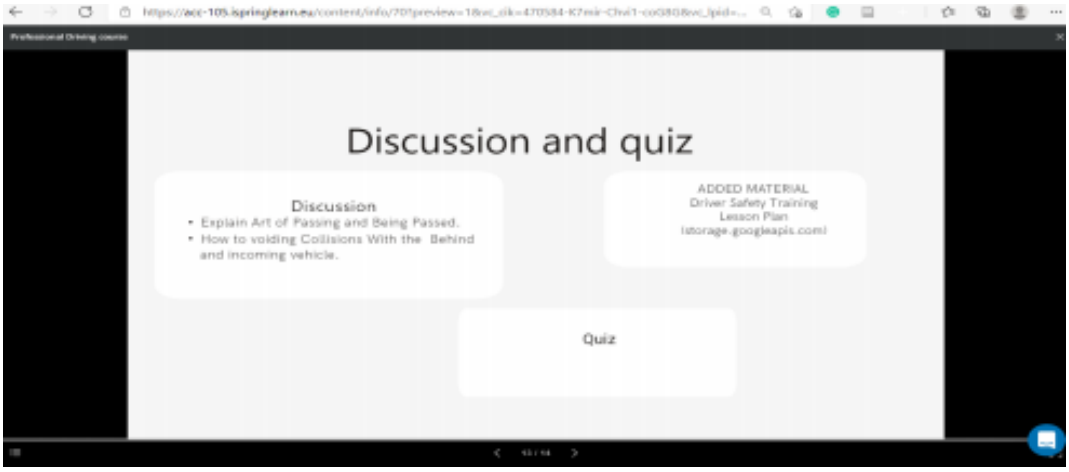
step 2: Trainee access the courses and select from a list of courses content

Step 3: The trainee selection of the course.

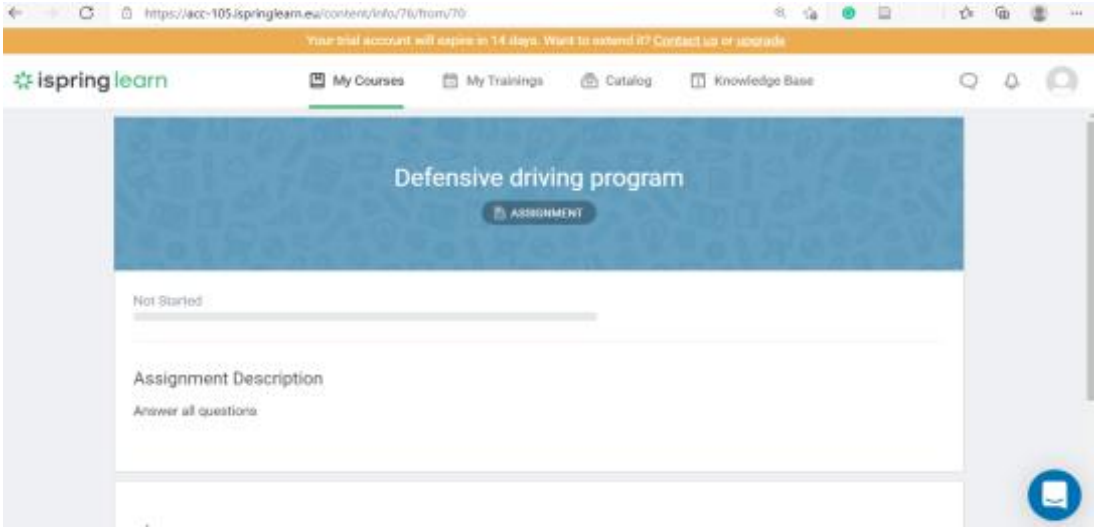
Figure 16: Series of steps (see step 1,2&3) for the trainee (bus driver) to navigate the learning platform.

Source: (self-sourced,2021)

Step 4: the trainee will start to use course content materials.



step 5: The discussion and quiz



step6: The individual assignment.

Figure 17: Series of step(see step4,5& 6) for a trainee in the eLearning platform

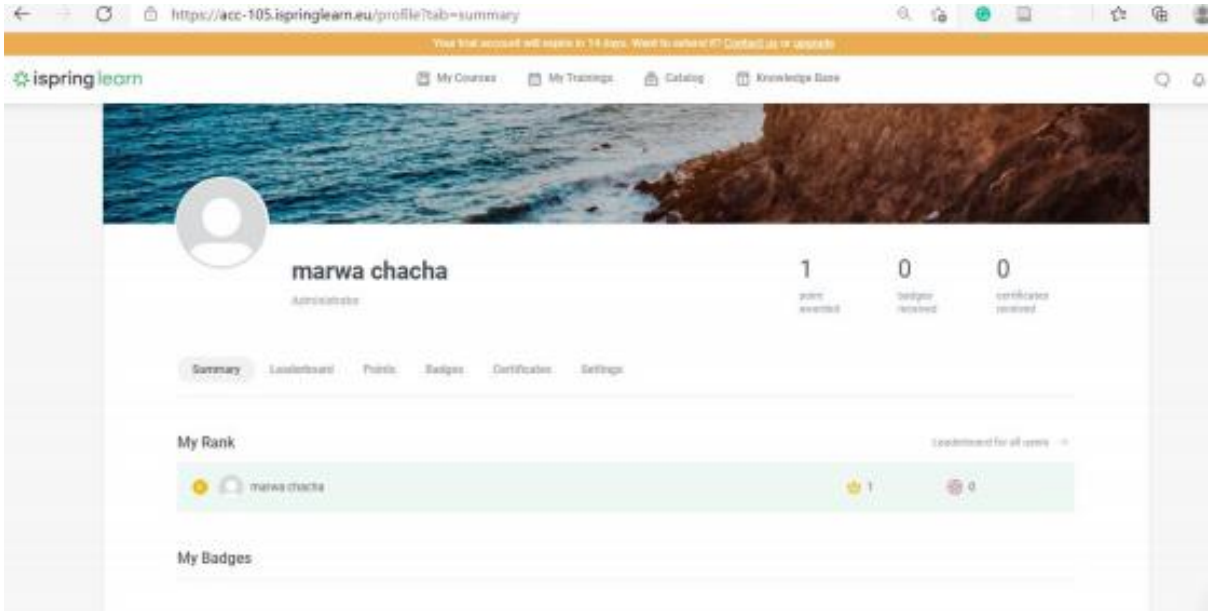


Figure 18:The platform can create feedback for the trainee and trainer; the trainee uses the PowerPoint quiz as gamification while the trainer also sends the information.

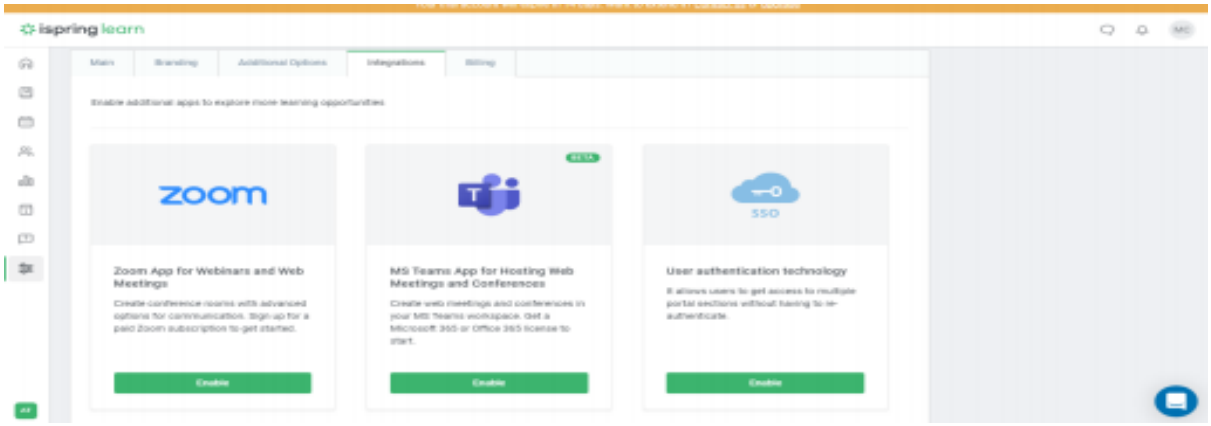


Figure 19: the other option of meeting the virtual classroom (Blended) eLearning

6.3 Summary

Last but not least, Thus a sample of software that has a relevant feature for eLearning. The software's limitation is required to upgrade since it requires the subscription cost based on the number of the author of the course. A matter of understating the layout of eLearning, it has shown the practical function. The missing stage was how the eLearning could be applied to the experimental technics for awareness, hazard perception, and self-perception of a trainee as part of integrating with simulator and telematics functions. During the development of the project, it should take this feature into considerations. The tool will access multiple devices like smartphones, tablets, computer (laptop), and vehicles. Also, the data will be filled and generated in a database that will lead to knowledge about trainees' skills on average and each case. Thus, it can customize the quizzes concerning this knowledge. If a trainee fails in a specific examination/ quiz (which are related to a defined training course), he/she will repeat to solve the task. Assignment/quiz that creates problems for a multitude of trainees will constant tracked by technicians.

Table 34 the summary of prototype eLearning layout training package for bus driver in Tanzania

Category module	Submodule or Material name	Time	Method of evaluation	Training techniques
Course on Traffic rule	-National and international road traffic acts - Regulations that govern driving on public roads and highways in Tanzania. - Observed warning and regulatory signs, Road Markings and traffic lights - Understand their roles and responsibilities as professional drivers - Understand the requirements and process of obtaining a bus driver's license in Tanzania.	40 min 60 min 40 min 60min 30 min	Multiple choices, True and false Briefly explanation	Animation Package Videos, audio and PowerPoint Discussion
Course on defensive driving training	-Identify the causes of road crashes and their consequences - Understand defensive driving principles. - Recognize everyday situations that lead to collisions -Understand that personal attitudes and defensive driving habits are crucial to preventing Collisions	30 min 40 min 30 min 50 min	Multiple choices, True and false Briefly explanation	Animation Package Videos, audio and PowerPoint Discussion
Injury prevention	- Handle minor emergency incidents in a professional manner - how to manoeuvre the bus safely in the event of a mechanical breakdown - Understand how to handle fire incidents	30 min 30 min 30 min	Multiple choices, True and false	Animation Package Videos, audio and PowerPoint Discussion
Fuel-efficient driving	-Critical principles of fuel-efficient driving - Drive and operate in a fuel-efficient manner - Identify types of road transport environmental Pollution - Identify and manage the impact of road transport on the environment	40 min 40 min 30 min 40 min	Multiple choices, True and false Briefly explanation	Animation Package Videos, audio and PowerPoint Discussion
Health and ergonomic	- Road traffic legislation for Hours of Service requirements - how to record and maintain a log of their hours of driving - understanding of driver and employer responsibilities - Identify and provide important information about hazards in their workplaces	30 min 10 min 10 min 40 min	Multiple choices, True and false	Animation Package Videos, audio and PowerPoint Discussion
Customer care	-Understand how to manage passengers and deliver compelling customer service - Understand the general passenger loading and unloading procedures - Know the legal passenger loading limits and bus capacity - Safely load, unload and transport passengers	40 min 40 min 30 min 40 min	Multiple choices, True and false Briefly explanation	Animation Package Videos, audio and PowerPoint Discussion
Total	Submodules and materials 24	740 min	4	5

Selfsource,2021

CHAPTER 7 DISCUSSION:

Professional bus driver training has a positive influence on safe driving behaviour in given fleet companies. This study focused on developing the alternative method of the learning process that raises awareness of road safety to professional bus drivers. The discussion focused on the current condition for professional driver bus training in Tanzania, evaluation of the existed curriculum and adoption of eLearning factor with developing the prototype of the online platform.

7.1 The Current Situation of Professional Bus Driver Training in Tanzania:

The National Institute of Transport (NIT) and Vocational Educational and Training Authority (VETA) have conducted bus driver training in Tanzania. The results from the questionnaire show that respondents were award to the institution responsible for commercial driver training in Tanzania. 39.7% for NIT, 22.5% for VETA and 37.1% for all NIT & VETA were responsible for commercial driver training. The previous research conducted by SUMATRA, 2017 explained that NIT had a specified curriculum for professional bus drivers training, which started in 2015. In addition, the Passenger public Service Drivers are required to undergo a refresher course before renewing their licenses. However, the survey result from respondents showed that 69.1% joined to training while 35.9% paid only licenses fees, indicating the low level of enforcement of the regulation of LATRA act 3 of 2019.

Furthermore, the results of the survey described the weakness of professional driver training in Tanzania. The main four aspects investigated in this study; the lack of a safety lead agency overseeing; Quite easy to pass compared to international driving, the absence of a structured practical driving training programme and The minimum hours of driving test. 47% of respondents respond to the lack of safety lead agency as a significant problem followed by a minimum hour of driving practical test about 27%. Thus agreement related to an interview conducted with the head of the commercial drivers association (UWAMATA). Research conducted by SUMATRA (2017:109) identified the lack of leading agency; the author explained in detail that even the hour of learning and testing is very minimal compared to the international standards. However, the head of the department of LATRA, during the interview, described since 2019, their organization has given the mandatory authority to regulate commercial vehicle drivers, including bus drivers. They have registered about 2500 commercial driver online platform for monitoring commercial drivers.

Lastly, the recruitment system of the bus companies in Tanzania uses the lower qualification for transit driver (daldala). As a result, many novice drivers directly operate the bus without having to give special training for them.

7.2 Evaluation of Existed Passenger Service Vehicle (PSV) Curriculum:

The existing curriculum for bus driver training in Tanzania for refresh professional bus driver is relevant for improving skill and knowledge of road safety. According to transiad (2015), the curriculum specifies the minimum standards of competence for drivers of large commercial vehicles (freight and passenger). The training program designed to be competency-based; it includes the specification of training modules discerning practical and theoretical training hours, entry requirements and duration of the course, and required previous training and experience. The challenge remain is how to implement of curriculum on the learning process and to assess trainee. The time is very minimum to learn about 19 modules of theory and practice for ten days. Thus, it also has been reported by SUMATRA (2017:13) there is no checks or auditing of the final examination process or the police examiners undertaking the task. The Canadian curriculum for professional commercial bus training is a 12-week programme with 120 hours of classroom time and 185 hours practical for initial qualified training. While in Sweden, the Drivers take a 10-week course to qualify for a commercial vehicle license (Brock et al., 2007:15).

However, the survey and interview result shows the need to have the specified curriculum for periodic professional bus driver with relevant contents and minimum time of an hour for a theory about 35 hours and practical also 35 hours. The study conducted by Baten and Bekiaris (2003) under the TRAINER

project in the EU suggested that the average number of theory lessons taken varies from 5 to 25 hours. Likewise, the average number of practical lessons varies from 25 to 35 hours. Also, European directive 2003/59/EC recommended 35 hours for periodic training of commercial vehicle drivers. Therefore, Tanzania should adopt a specified curriculum of client-centred, which will improve safety and fuel economy.

Last but not least, the current road accident situation has been reduced year by year due to mandatory training for all bus drivers who drive long-distance, transit vehicle (daladala), and BRT. Thus, the research study used Information obtained from the survey respondents to augment the literature review results in characterizing current training practices and support inferences about the effectiveness of specific, enhanced training practices and approaches for refresh passenger drivers. The defensive driver course was among selected modules from the respondent, a shown in figure 10. Also, GPS Tracking bus technology monitored by LATRA has improved the enforcement of the traffic law in table 27. The comparison between traffic crash injuries and deaths before and after commercial vehicle drivers includes bus drivers. The report from the National traffic police under the Bloomberg Philanthropies' Initiative, known as BIGRS 2015 – 2019, the trend of road safety has improved for five years of driver training launched.

7.3 **Development of eLearning Module and Prototype for PBDT***:*

The periodic professional bus driver training has several approaches to accomplish this goal, including in-person classroom training, electronic learning (e-learning) and a blended approach Goettee et al., (2015). In Tanzania, only one method used in-person classroom. This study has investigated the load factor which influences the readiness or adoption of eLearning for training, as shown in table 25. The eLearning module must ensure the quality material contents of the module and devices on the eLearning tool. Chapter 5 was the modules that the respondents preferred as a package of eLearning, which aimed to raise awareness of road safety and improve the skill and knowledge of bus drivers. Several studies in Europe and United States supported the module developed in this study. In Europe, the periodic training focused on safety, responsible and Eco-driving in fleet companies as reported by; CIECA-RUE Road User Education Project (2014), Panteia (2014) and ROSPA (2018). While in the USA, the studies conducted by Brock et al. (2007:14) and technical analysis of driver training impacts on safety (ATRI, 2008) described the relevant modules for commercial driver training for eLearning.

Furthermore, chapter 6 shows the prototype of the sample of the eLearning platform, which included the respondent opinions of the trainer and trainee. The development of the tool considers the devices installed, such as smartphone, tablet, and computer (laptop). The survey results are that most respondents preferred to use smartphones as a device for professional driver training, shown in figure 10. Also, the proposed eLearning should be easy to use for both trainer and trainee. In addition, its interface has to be interactive so that the student should actively participate. The training platform can tailor the PowerPoint presentation as shown in annexes 5 &6, audio and video, and virtual classroom through zoom. The trainer can post the assignment, quiz, and test on the platform; it can integrate this with other technology tools like gamification, which provides intrinsic motivation to bus drivers. In Europe, many studies related to commercial driver training, which includes training methods, like PRAISE, 2011, IDREMs, 2020. Ex-post evaluation study report Study on the effectiveness and improvement of the EU legislative framework on the training of professional drivers, 2014 suggested the eLearning tool as a training tool for distance professional drivers. The use of safe driving apps and the influence of the social environment, smartphone integration in driving safety, and gamification emerged as an intervention for behavioural change in Europe and the United States of America (Brock et al., 2017).

CHAPTER 8 RECOMMENDATION AND CONCLUSION:

8.1 Recommendations*:*

In Tanzania, little academic research exists related to bus driver training programmes, particularly in eLearning studies. In addition to that reach the adoption of the e-learning stage, successfully driving schools like NIT should implement the prototype with contents of module eLearning. As discussed during an interview with one of the trainers from agreeing if possible, they can implement in the institute for trial with small group bus driver trainees. The top management of the organization, departments, staff trainer, and trainee is essential to consider during the implementation of this project, as shown in Tables 13 and 24.

Moreover, the external environment can influence eLearning adoption, making it successful like high-speed connectivity internet (4G and 5G), the operation cost for organization and trainees. Also, the regulation can bring confidence to bus driver school to implement eLearning in driving training in the whole nation.

Furthermore, the strategic procedure for sustainable implementation of the project within bus driving school and other stakeholders should consider executing projects. LATRA, Traffic policies, and fleet companies, before implementing the eLearning bus drivers training, should be involved in discussion since all have mutual benefits. A brief explanation of the use of stakeholders when will implement the project.

Starting with a driving school, this organization expected to adopt the training method in driving training, for example, NIT and VETA. The benefit will be to expand the enrollment of students, accessing the assignment and quizzes to every student quickly and post feedback after graduate license as to how developed countries practised (Brock et al.2007; ATRI, 2008; Chen & Chao, 2011and Jones et al. (2009). Also, the trainer will have a more alternative learning process method like using PowerPoint, as shown in annexe 5 and 6. The option of using audiovisual gamification to the student will improve the skills and knowledge expected. The student will reduce the cost of travel and gain experience from peer to peer discussions.

Secondly, LATRA, as government land transport authority, has mutual benefit since also involved in overseeing the road safety for commercial vehicle included long-distance buses and transit (daladala). Further research should integrate the eLearning tool with an existing GPS tracking tool that controls the bus speed, which will monitor driver behaviour. The LATRA will suggest the type of training required to target the driver group based on the feedback of the technology tool as a coaching tool. Thus, traffic police intervention will be equivalent if drivers get more fines after a certain period is requested to go back to training. It is related to that problem, how Europe did reduce the rate of using alcohol while driving under the European project HERMES reported PRAISE, 2010.

Thirdly, fleet companies have a mutual impact on developing skill and knowledge for their employee to ensure the safety and efficient utilization of fuel. In addition to that, they will maximise companies' profit and monitor their driver performances feedback when integrated with other technology tools like telematics. It will increase the driver professionalism and become valued and promoted to the organisation by giving intangible and tangible motivations.

Furthermore, the eLearning professional bus driver training has multisector involved for effective implementation at national levels; the significant outcome of the training is easy to update and centralized information to learners. Thus, it increases awareness of road traffic crashes and fatality, which improves the skill and knowledge of bus drivers, and hence road safety improves.

8.2 Conclusion*:*

Overall, the research evidence suggests that most current driver training reduces accident involvement or crash risk among commercial bus drivers. Technology has played a significant role in reducing the risk of accident, especially in speed managements. The research investigated the paradigm shift of learning method and trainee assessment by adopting the eLearning (blended) method as an alternative or mixed forms of professional driver training. The study reviewed the literature reviews, semi-structured interview and survey questionnaire to develop the eLearning modules and prototypes features. Also the best practices from developed countries like European country has shown the success on driver behaviour changes through the eLearning training like risk perceptions, attitudes and Eco-driving(Panteia (2014). The bus driver schools will extend eLearning implementation in Tanzania to accessing professional training, particularly bus drivers. Thus, it will bring the fleet managers the opportunity to access the training and improve the safety cultures within the fleet companies.

All in all, the fleet organization can use the eLearning bus driver training to assess their driver's trained post licenses by integrating the existing technology of tracking bus tool. These will be having the advantage to driving schools for feedbacks of their trainee, the fleet company's measure performances of drivers (Eco-driving fuel economy) and the LATRA for enforcement of the law and couching bus drivers

CHAPTER 9 LIMITATION AND FURTHER RESEARCH STUDY

9.1 Limitations of the study:

Firstly, this review was limited to providing insight existed curriculum of professional bus drivers (PSV), the literature review from reports, scientific papers of academic and practices writing found on websites. The development of eLearning modules aims only to raise awareness of road safety to professional bus drivers. The prototype used was the trial version of "ispring suite 10 Software". Due to Coronavirus (COV-19), the survey conducted via an online platform in Tanzania. The interview conducted only via Whatup to the trainer from NIT, LATRA and UWAMATA.

Secondly, the researcher gathered the set data in Dar es Salaam only. Therefore, the samples are limited to represent the overall Tanzania drivers. Also, the piece recruited might be relatively small, considering the large population of Tanzania. Similarly, the study did not address national policies and regulations for bus driver training related eLearning strategies. Thus, readers should consider regional differences while interpreting the findings. Finally, due to time constraints, the author did not test the prototype for many trainees and only accessed two trainers.

Thirdly, the study observed the behaviour of the professional before the eLearning programme implemented. Research and data collection will take place over a limited time. Elementary bus drivers in Dar es Salaam usually did not use more emails; thus needed orientation to them before the programme or other things are required to be used for them to create an account. The study will have a limited sample size that is not representative of the bus driver's populations in Dar es Salaam.

Fourthly, the questionnaires survey aimed only to identify the main components of the existing learning process and assess training for Bus drives in Tanzania and e-learning adoption features. Thus w based on the literature review conducted by SUMMATRA (2017) showing the existing driving training situation. Therefore, the study did not seek deeply detailed opinions from the participants about bus drivers' existing curriculum.

9.2 Further study

The proposed conceptual framework of implementing the learning in section 2.5.5 described the main procedure that would help implement eLearning. The three factors, such as readiness of driver school, the intensity are adopting of eLearning tool identifying the level of eLearning to adopt from a continuum of eLearning (blended) units impact of training aimed to be quality. The revised figure 6 show the direction flows of the framework model. This model adopted from accountancy education described blended learning assessment as best practices (Lily et al., 2013).

One of the objectives of this research was to suggest and develop a conceptual prototype that can be used as a roadmap for future study with empirical data collection and analysis and to establish a complete overview of the adoption of e-learning in the context of Dar es salaam, Tanzania. Hence, the main concern was to allow the model to consider the critical factors and barriers that might influence the acceptance and adoption of eLearning for bus driver training. Due to time constrain, it was challenging to have access to implementing the training package in NIT. For future research, the researcher proposed implementing the eLearning based on the empirical studies conducted in this research and discussed in Chapters 4, 5 and 7.

Moreover, the research further proposed integrating the eLearning with safety fleet tool in a fleet organization. It also includes the training guideline for commercial vehicles, which will support the feature research for learning. In addition to that, the practical techniques of stimulators and telematics will improve driver performance and safety. In developed countries like Europe and America, they have

more study about the training technology tool that enhances drivers' performance, safety, and health. IDREAMS (2020) publication has best practice on commercial driver’s intervention for real-time and posts feedback on driver performance based on gamification, part of a futures study in Tanzania.

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Annexe 1: Survey questioners

Welcome to the Professional Driver Training Survey! Thank you for your participation.

My name is Marwa Chacha, a master student of Transportation Science, Hasselt University in Belgium. This survey is part of my master thesis. I hope the results from this survey will be helpful in the development tool of professional bus drivers training programmes in Tanzania. The survey should only take less than 5 minutes to complete. ***Please notice there are no right or wrong answers! Your honest personal opinion is what matters, and the results will be confidential.***

For any questions, please contact: Marwa Chacha (marwa.chacha@student.uhasselt.be)
For any complaints or other concerns regarding the processing of personal data, you can get the UHasselt data protection officer: dpo@uhasselt.be. For more information about exercising my rights or submitting a complaint, please see our Privacy statement.
Clicking on agree below indicated that: You voluntarily agree to participate and disagree if you do not wish to participate in the research study.

- o Agree (1)
- o Disagree (2)

Section A: Demographic characteristics and bus driver behaviour.

Q1.What is your gender?

- o Male (1)
- o Female (2)
- o "x" (3)

Q2. What is your age?

- o Below 25 (1)
- o 25 to 34 (2)
- o 35 to 44 (3)
- o 45 to 54 (4)
- o 55 and above (5)

Q3. What is the highest level of education you have completed?

- o Primary school (1)
- o Secondary school (2)
- o College (3)
- o University (4)

Q4 Do you have a bus driving licence?

- o No (1)
- o Yes (2)

Q5. What is your occupation status?

- o Bus driver (1)
- o Trainer (2)
- o Other (3)

Q6. Which type of vehicle do you operate currently?

- o School bus (1)
- o Transit bus (Daladala) (2)
- o Bus Rapid Transport (BRT) (3)
- o Long-distance passenger bus(Interregional bus and country) (4)

Q7 What is your experience of operating a bus?

- o <1 year (1)
- o One year (2)
- o 1-2 year (3)
- o 3-5 year (4)
- o >5 years (5)

Q8 Do you know about the professional bus driver training programme in Tanzania?

- o Yes (1)
- o No (2)

Q9. Which institution is responsible for the professional bus driver training programme in Tanzania? (You can indicate multiple answers)

- ☐ National Institute of Transport (NIT) (1)
- ☐ Vocational Educational and Training Authority (VETA) (2)
- ☐ All above are responsible (3)

Q10.Have you ever attended a periodic professional driver training programme before you renewed your driver licence?

- o No (1)
- o Yes (2)

Q11.How do you renew your driving license when it expires? (You can apply multiple answers)

- ☐ After successful completion of bus driver training at NIT (1)
- ☐ After successful completion of bus driver training at VETA (2)
- ☐ Sit the official Traffic driving test (3)
- ☐ Paid for renewed license fee without bus driver training (4)
- ☐ All the above (5)

Section B: The evaluation implemented the PBDT curriculum

Q12. How many hours of theory is enough, in your opinion? (Initial professional bus driver training programme)

- 35 hours (1)
- 46 hours (2)
- 52 hours (3)
- 45 hours (4)

Q13. How many hours of practical training is enough in your opinion? (Initial professional bus driver training programme)

- 18.5 hours (1)
- 28 hours (2)
- 35 hours (3)
- 57.5 hours (4)

14. Do you think professional bus driver training will improve traffic safety in Tanzania?

- No opinion (1)
- 'No (2)
- Yes (3)

Q15. What are the teaching methods used during your training? (You can indicate multiple answers)

- Classroom sessions (1)
- Practical demonstration and instruction (2)
- Group discussion (3)
- All above were used (4)

Q18. Please indicate the areas in which you are interested in receiving more training. (You can tell more multiple answers)

- ☐ Customer service (1)
- ☐ Defensive driving (2)
- ☐ Fuel efficiency (3)
- ☐ Injury prevention (4)
- ☐ Health and ergonomic (5)

Q21.Are you satisfied with the assessment training method used during your professional bus driver training programme?

- 'No opinion' (1)
- No (2)
- Yes (3)

Q22. What is the assessment method? (You can indicate multiple answers)

- Written examination (1)
- Oral test (2)
- Practical driving assessment (3)

- All above used for evaluation (4)

Q23. What is the weakness in assessing the professional bus driver? (You can indicate multiple answers)

- ☐ The lack of a safety lead agency overseeing (1)
- ☐ Relatively easy to pass compared to international driving (2)
- ☐ The lack of a structured practical driving training programme (3)
- ☐ The minimum hours of driving test (4)

Q24. What are the significant areas of assessment?

- Curriculum outcome (1)
- Learning resources (2)
- Learning activities (3)
- Practical driving skills (4)
- All the above (5)

Section C: The adoption eLearning aspect for professional driver training.

Q16. Do you know about the E-learning training method?

- No (1)
- Yes (2)

Q17. What's your opinion on the use of E-learning methods in the professional bus driver training programme?

- 'No opinion' (1)
- Very bad (2)
- Good (3)
- Bad (4)
- Very good (5)

Q19. Which devices would you recommend for the E-Learning tool? (You can indicate multiple answers)

- ☐ Desktop (1)
- ☐ Tablet (2)
- ☐ Computer (3)
- ☐ Smart phone (4)

Q21 Do you think E-Learning will improve road safety?

- 'No opinion' (1)
- Strongly disagree (2)
- Disagree (3)
- Agree (4)
- Strongly agree (5)

Q25. Eco-Driving can reduce fuel consumption by 10% or more. How beneficial would this cost-saving be to you or your company? (You can indicate multiple answers)

- 'No opinion' (1)
- Not beneficial (2)
- Slightly Beneficial (3)
- Moderately Beneficial (4)
- Very Beneficial (5)
- Extremely Beneficial (6)

Q26. What is the benefit of assessing professional drivers during the training programme? (You can apply multiple answers)

- ☐ Observes unique personal qualities (1)
- ☐ Identify the ways they learn best (2)
- ☐ Strengthen their skills and health (3)
- ☐ Increased road safety (4)
- ☐ Increased professionalism (5)

End of Block: E-learning training

Annexe 2: Interviews

Trainee (commercial driver association) :(UWAMATA)

Q1: What aspects of the tool do you like?

Q2: What is your suggestions and recommendations on the adoption of eLearning for professional bus driver training?

Regulation support the adoption of eLearning :(LATRA)

Q1: Are there regulation which supports the adoption of eLearning?

Q1: How does your organization use the technology to improve road safety?

Q2: What is your suggestions and recommendations on the adoption of eLearning for professional bus driver training?

Trainer Readiness to adopt eLearning :(NIT)

Q1: What are current training method involves online training in your organization?

Q2: What aspects of the tool do you like?

Q3: What aspects of the tool do you disagree with that?

Q4: What would be your recommendations for improving the tool?

Q5: Based on your review, what is your general opinion of the e-learning adoption tool?

End

Trainer

"I know in our Organization to implement use e-learning is essential, but I think it would require a lot of effort to learn how to use such systems. However, in our department, I don't think more trainees will use e-learning; other departments use eLearning to post their student's study materials and online tests. I think it is good initiatives to our department will help a lot since currently, we are using what sup on making the discussion "(Interviewee 1 from NIT).

"E-learning is becoming a necessity in the education process, and we all have to use it. I don't think it will be difficult to use such systems, but we need to implement the trial version first**."(**Interviewee2 from NIT)

Annexe 4: Demerit points to the bus driver who convicts the traffic rule

Demerit Points

A table indicating type of offences and number of points attached to each offence is here under:

SCHEDULE A: FOR DRIVERS

S/N	NATURE OF OFFENCE	Penalties in TZS	NUMBER OF DEMERIT POINTS
1	Driving above specified speed limits	50,000/=	20
2	Carrying passengers in excess of the maximum allowed number	30,000/=	15
3	Driving the vehicle while passenger's door is open	30,000/=	15
4	Not maintaining timetable	50,000/=	20
5	Not maintaining logbook	30,000/=	0
6	Operating the vehicle on other routes not specified in a licence	30,000/=	15
7	Terminating journey before reaching final destination	50,000/=	20
8	Driving a vehicle which does not have public service licence or insurance	50,000/=	0
9	Driving a vehicle without certificate of Authorisation	50,000/=	20
10	Driving vehicle without uniform	30,000/=	0
11	Driving a vehicle without identity card	30,000/=	0
12	Driving a vehicle while attending mobile phone	50,000/=	20
13	Not obeying lawful order of the police officer or officer of the Authority	50,000/=	20
14	Driving under the influence of alcohol or any other narcotic substance at any amount.	0	0
15	Mistreat or harass any passenger	30,000/=	10
16	Blocking or obstructing intentionally other service providers	30,000/=	5
17	carrying live animal or dangerous goods in the licenced motor vehicle	30,000/=	5

Source: Certification of Commercial Vehicle Drivers and Registration of Crew) Regulations, 2020

Annexe 5 Course content and module 1 PowerPoint used in eLearning

PROFESSIONAL BUS DRIVER TRAINING PROGRAM(PBD) IN TANZANIA

E-LEARNING (BLENDED) COURSE

SAFE DRIVER SAFER JOURNEY

Training course roadmap

FOR PASSANGER BUS DRIVER WITH LICENCE D AND E COMMON NAME (PSV)

Description of the course

This course is professional bus driver online training based on (competence practical assessment. It involves the technology tool like telematics and gamification which aim to improve the skill and road safety for both passengers in Tanzania.

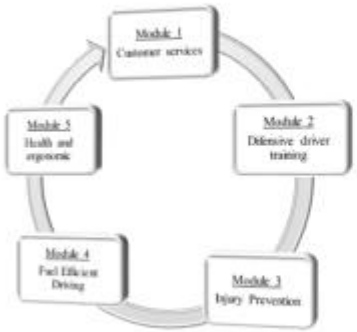
Teaching methodology

The full package of course has divided into two part theory and practical in which practical will be taught on campus and theory major part will be online. The course also includes a quiz section at the end. You need to answer at least 75% correctly to pass the quiz and complete this course.

The duration of course

This course will take approximately 35 hours to complete course include practical session

Content lists



SELF SOURCE ,2021

MODULE 1: CUSTOMER CARE

- Objective: ability to Adapt behaviour to help enhance passenger comfort and safety.

MODULE 2: DEFENSIVE DRIVING

- Objective: To improve bus driver ability to avoid collisions by raising awareness, knowledge and skill to bus driver

MODULE 3:INJURY PREVENTION

- Objective: To make drivers aware of the risks of the road and how to prevent injury when an accident happened at work

MODULE 4: FUEL-EFFICIENT DRIVING

- Objective: To know the social environment of road transport and the rules governing it.

MODULE 5: HEALTH AND ERGONOMIC

- Objective: awareness of the importance of physical and mental ability.

STRATEGIES TO IMPLEMENT (BLENDED) E-LEARNING

Web-based gamification scenario

- Online platform used individually or in groups to simulate behavior change as a practical application of materials.

ecorded lectures (voiced-over PowerPoint

- Recording files participants can watch and reference to learn the content with added material from textbook and articles

Hosted online office hours

- Time to ask questions of the bus driver trainer in a live, interactive manner.

Discussion questions and forums

- Written dialogue between peers; also helps the bus driver trainer check.

Written paper:

- Assignment to turn in that demonstrates an understanding of the topics.
- Online test: Assessment demonstrating knowledge of the training course followed by practical training and test.

Case study

DEFENSIVE DRIVER TRAINING

A defensive driver training course is designed to teach safe driving techniques and describes responsible driving habits to drivers. It goes beyond mastery of the rules of the road and the basic mechanics of driving (NET, 2016).

COURSE CONTENT

- Reasons & Causes of Accidents

Example of the cause: Alertness, Vehicle Condition ,Attitude, Speed tailgating Improper changing distractive, fatigues and drugs/alcohol

- **Explain the 5 habits of Defensive Driving**

Look to the Horizon. Identify the Hazards, Scan, Don't Stare, Always Have an Escape Route and Be Visible.

- **Understand the various Defensive Driving tactics**

Passing & Being Passed, Intersections, Backing Tactics, Lane Changes, Hazardous Conditions, Construction Zones, four and second rule.

Defensive driving requires bus driver to save live, time, money in-spite of conditions around you and action of other road users. The major cause of accident is human error, followed by environment factor as shown on diagram.

We don't want this to happen

The 5 habits of Defensive Driving

ook to the Horizon

- Aim the vehicle at a target well down the road.
- Keep eyes up to the horizon when steering to stay on your path.

Identify the Hazards

- Awareness of what is around you.
- Lighting: Night, Dawn, Dusk, Sun-glare
- Weather:–Rain, snow, sleet, fog, etc.
- Condition of the Driver Age, alcohol / drugs, fatigue, emotions and attitude
- Traffic–Time of Day

Scan, Don't Stare

- Most of your attention should be out front
- Check six Keys to Safe Driving: Good vision,
- Obeying traffic rules and regulations, Be courteous to others, Proper signaling and Physical fitness.
- Use the triangle method

Always Have an Escape Route

- Be Prepared!
- Expect the unexpected
- Don't get 'boxed in' by other traffic
- Check your blind spot
- Use the 2 second rule

Be Visible

- Communicate with Traffic
- Eye Contact
- Headlights:
- Turn Signals
- Horn
- Vehicle Body Language

Smith System Driver Improvement Institute, Inc. – Drive Different. Save Lives

1 Habit: Look to the Horizon

Look further ahead while driving will help to see other road user like other vehicles, pedestrians and traffic light. Also Keep eyes up to the horizon when steering to stay on your path. It easy to implement and reduces accident. What do you think?

2 Habit: Identify the Hazards while driving

Awareness of what is around you

Lighting: Night, Dawn, Dusk, Sun-glare

Weather:–Rain, snow, sleet, fog

Condition of the Driver Age, alcohol / drugs, fatigue, emotions and attitude

3. habit: Scan, Don't Stare

- Normal drivers look at the road directly in front of the vehicle.
- Don't just stare at the bumper of the car in front of you
- Obeying traffic rules and regulations, Be courteous to others,.
- Proper signaling and Physical fitness.
- Use the triangle method.

4. Habit : Always Have an Escape Route

Constantly ask yourself questions and make before escape the route. Some examples:
- What if the driver in front of you slams on his brakes for no apparent reason (an animal runs into the roadway, he blows a tire, etc.)?
- What if the approaching vehicle drifts into your lane?
- Will somebody run the red light or stop sign up ahead?

5 Habit: Be Visible

Communicate with Traffic, Eye Contact, Adjust mirror, turn Signal shorn and Vehicle Body

https://www.bing.com/images/blob?bcid=RIwVwu0hHLAC3Fbp71plBRPRfrKD.....-g

Understand the various Defensive Driving tactics

Improving your ability to avoid collisions:
–Knowledge, Foresight
–Alertness , Skill (Brock et al. 2007)

Speak up for your safety

1 Standard accident prevention formula
-Recognize the Hazard
–Understand the Defense
–Act

2 Apply Three "E's" to Traffic Safety
- Enforcement
- Education
- Engineering

3 Avoiding Intersection Collisions
- Lighted / controlled intersections, Left turns - right turns, Approaching intersections, Bicycles, Pedestrians, School Buses and R/R crossing

Discussion and quiz

Discussion
- Explain Art of Passing and Being Passed.
- How to voiding Collisions With the Behind and incoming vehicle.

ADDED MATERIAL
Driver Safety Training
Lesson Plan
(storage.googleapis.com)

Quiz

Thank you!

Annexe 6: Sample of PowerPoint: Module 2 Injury Prevention

Module 2

INJURY PREVENTION

Best-practice road safety strategies focus upon the prevention of serious injury and death crashes in spite of human fallibility.

Course Objectives

01. Describe the common cause of bus accident which result injury
    - Possible injuries

02. Understand safety precautions while planning for the journey.
    - Discuss positions and techniques to use while driving to prevent long-term injures

03. Identify ways to safety safe while working at bad environmental condition like extreme temperature and cold.

→

The common cause of bus accident

Common causes

- Bus operators driving while fatigued
- Drug and alcohol use by the driver
- Overloaded or improperly loaded buses
- Inadequately maintained parts and equipment
- Poorly-trained or speeding and distraction

Possible injuries

- Brain injuries
- Cuts and bruises
- Neck and back injuries
- Spine damage
- Burns
- Permanent scarring and/or disfigurement
- Bone fractures

(Kalter & Mabey,2020)

Vehicle Inspection before the journey

Why is a vehicle inspection important?

- It allows bus drivers to catch any issues before heading out on the road.
- When used prepared it prevent accident and serious injury.
- Increase safety, limit downtime, and
- get bus drivers to their destinations on schedule.

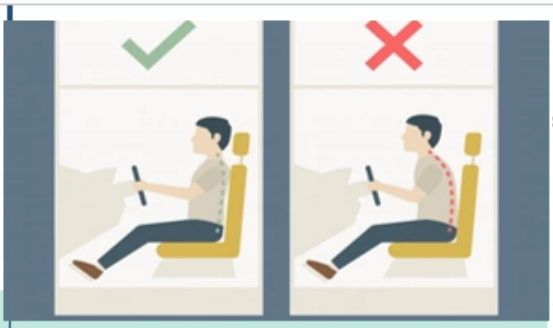
When should a vehicle inspection be done?

- Pre-operation inspection The inspection should be done before using the vehicle, at least daily.
- Post-trip inspection - occurred at the completion of each day's work, the driver is required to prepare a written report

The most important aspects of vehicle inspection

- Service & Parking (hand) brake
- Steering mechanism
- Lighting devices and reflectors,
- Tires, Horn
- Windshield wipers
- Rear vision mirrors
- Wheels and Rims
- Emergency Equipment

http://www.isrisafety.org/



Correct Driving Position

Seat position

Raise the inclination of the seat back to an angle of 100-110 degrees. This angle decreases the pressure on the discs in your low back.

Back rest

Adjust the steering wheel to allow easy reach aiming to have the elbows at an angle of 30°- 40°

Bus driver who drives long distances with poor driving posture can lead to a range of musculoskeletal problems, including back, neck, shoulder and leg pain. (physiotherapymatters,2015)

Head Rest

Adjust the headrest so that the top of the head rest is as high as the top of your head and tilted forward to be within an inch of the back of your head.

https://www.physiotherapymatters.co.uk/blog/correct-driving-posture

Seatbelt

The seatbelts reduce morbidity and mortality. 50 - 80% of all deaths of RTC could have been prevented by properly used seatbelt
Alaa K. et.al(2011)

Seat Belts Helps to Slow Down Your Body Motion in a Vehicle Collision and Prevents Injury

Bus driver's Exercises for a Long trip

Benefit stretching

- It increases flexibility and range of motion,
- Improving circulation of blood.

Exercise in the vehicle

- Abdominal Contractions, Seated Knee Lifts and Calf and Toe Raises.

At the Gas Station or Restaurant

- Lunges, Squat Hold and Jumping Jacks

At a Rest Stop

- Jump Rope, Pushups, Triceps Dips and Marching with High Knees.

(Mueller.J,2015)

BUS DRIVERS FATIGUES; Symptom and how to avoid

SYMPTOM OF FATIGUE

Five aspect

- Slower reaction times and impatience
- Cramps and stiffness
- Sore eyes and lack of concentration
- Inconsistent speed
- Poor driving performance

AVOIDING FATIGUE

Five aspect

- Look at your sleep schedule
- Hydrate often: drinking plenty of water good for your health overall
- Take breaks consistently: Every two hours take a break
- Switch up your listening
- If possible share the driving duties

https://www.prodrivers.com/

Working environment factor

Winter conditions

Each year, thousands of professional drivers are seriously injured due to not paying attention in winter conditions.

Risks

Slip/Trip and Fall injuries are the most common type of injury for drivers during winter condition.
(Snow, rainfall and Ice)

Measure to be taken

SLOW DOWN, never be in a hurry.
Always wear proper footwear
Always use your seat belt

Summer condition

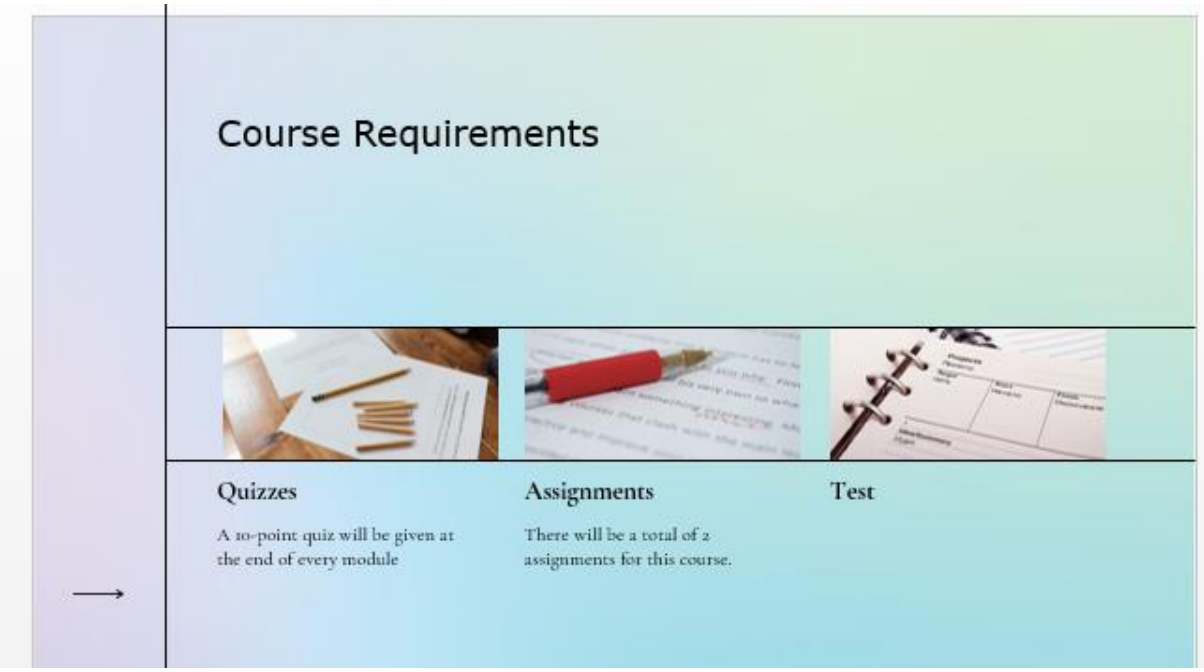
There is a sudden increase in traffic – teenagers who had been in school all day are now free to take to the road for pleasure.

Risks

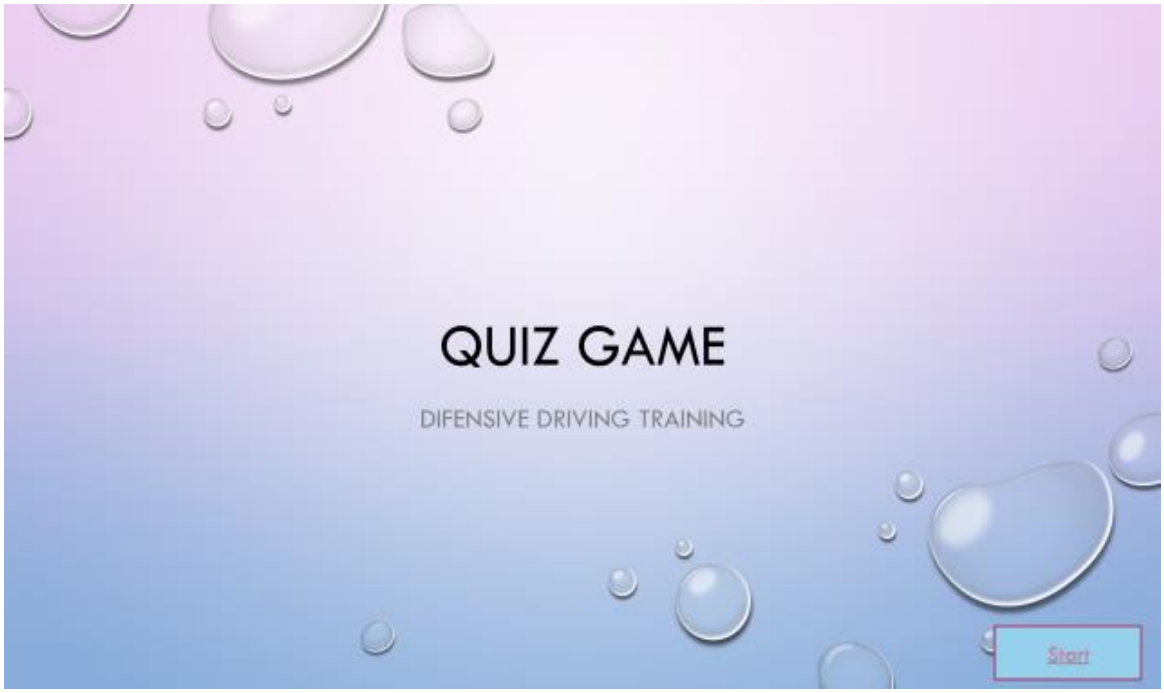
- Increased Road Congestion
- Tire Blowouts
- Teens on the Road
- Excess Heat
- Driving distractions

Measure to be taken

- Pack some extra water
- Regularly check your tires, especially during heatwaves.
- Regularly check the travel adviser before starting the journey.



Annexe 7 PowerPoint question for Defensive Training module



90% OF TANZANIA BUS'S ACCIDENTS ARE CAUSED BY?

Improper Backing

Speeding

Distractions

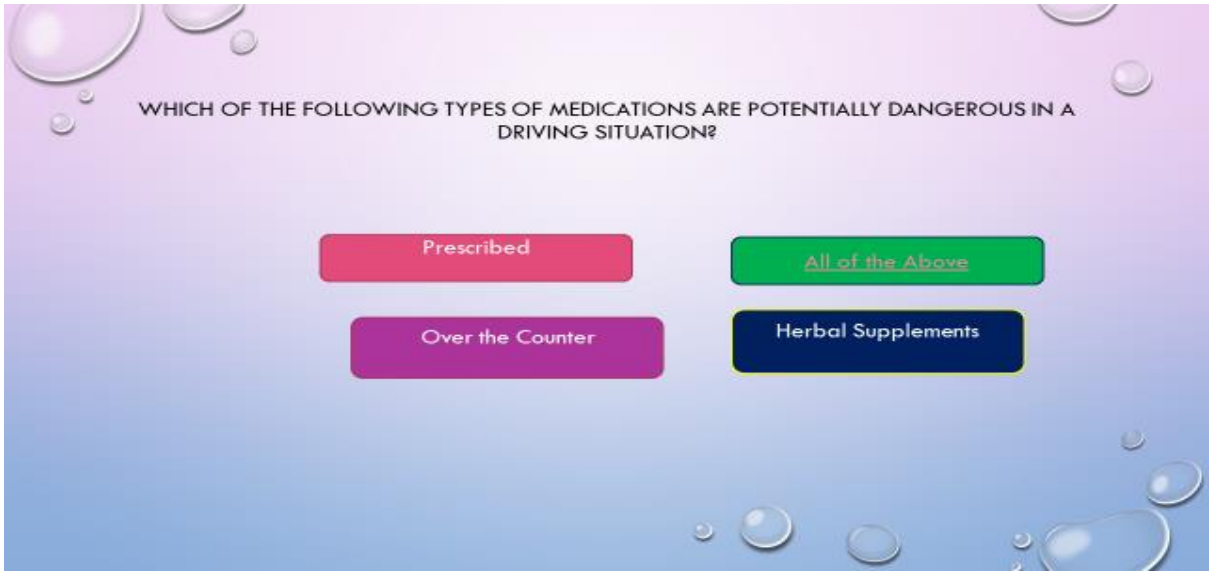
Failing to Yield at Intersections

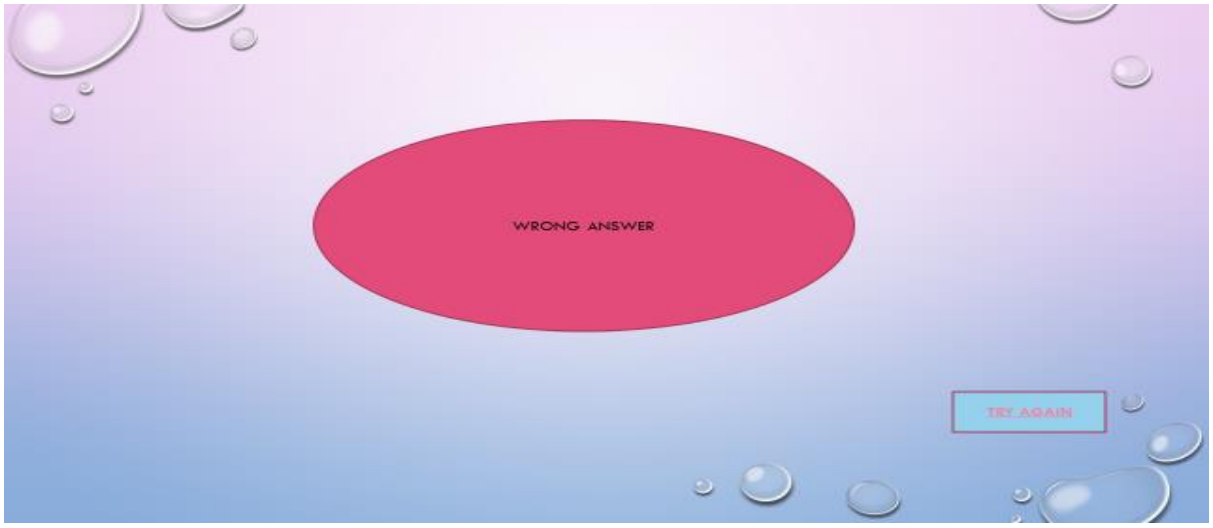
WRONG ANSWER

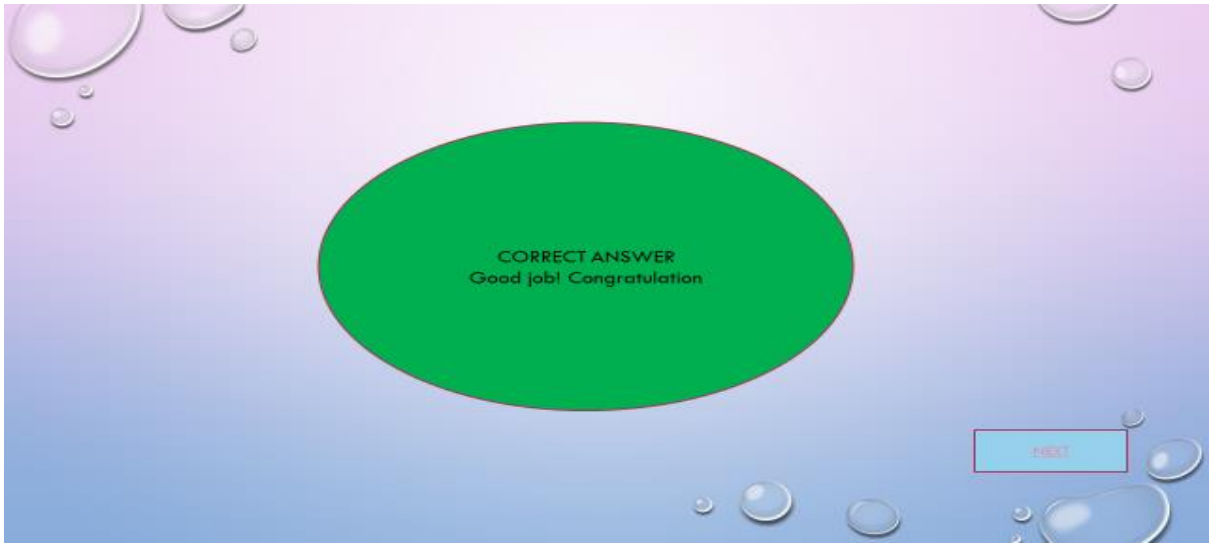
TRY AGAIN

CORRECT ANSWER
Good job! Congratulation

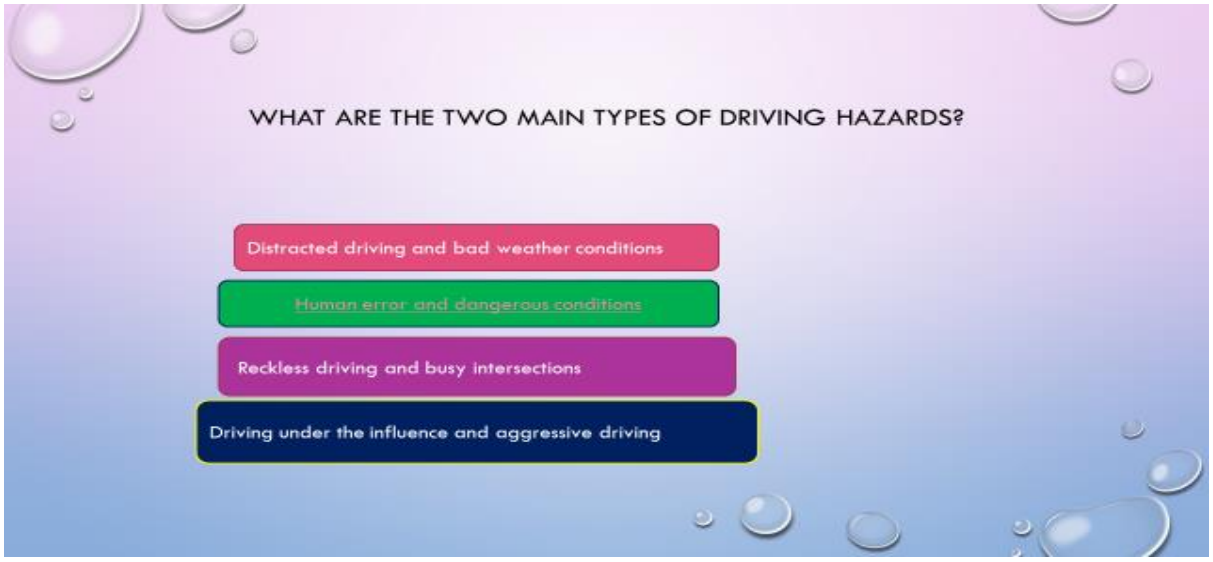
NEXT


WHICH OF THE FOLLOWING TYPES OF MEDICATIONS ARE POTENTIALLY DANGEROUS IN A DRIVING SITUATION?
Prescribed
All of the Above
Over the Counter
Herbal Supplements

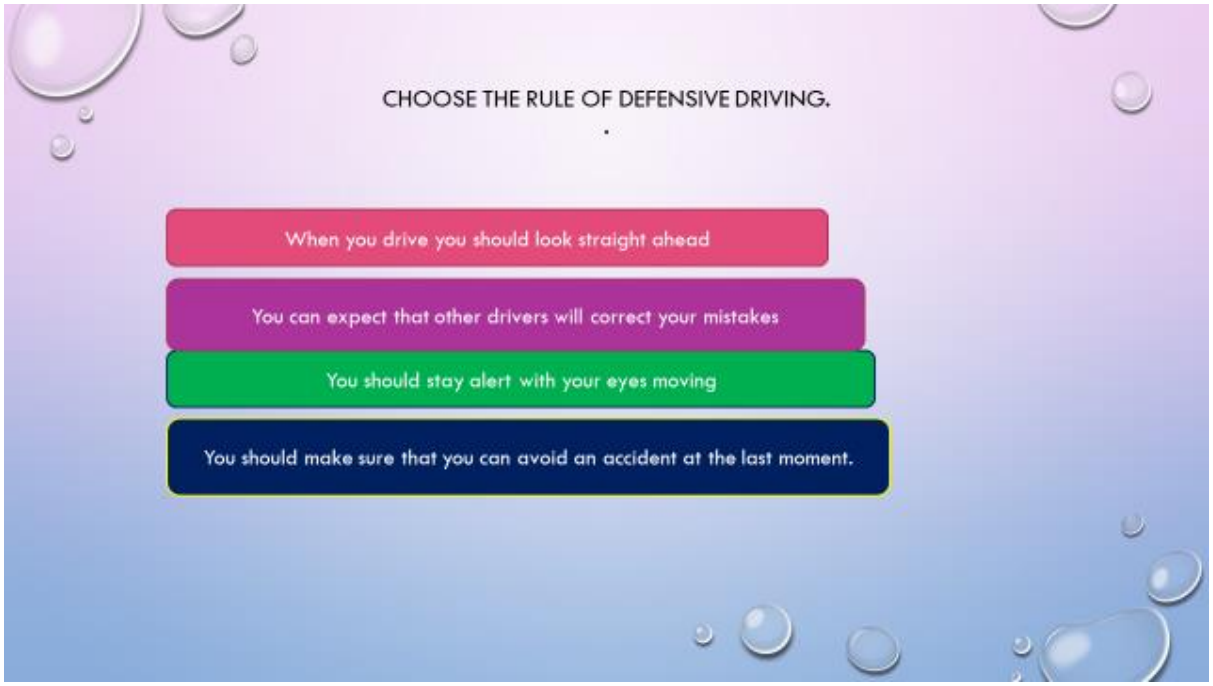

WRONG ANSWER
TRY AGAIN


CORRECT ANSWER
Good job! Congratulation
NEXT


ACTIONS CONSIDERED TO BE DISTRACTED BUS DRIVING INCLUDE
A. Speeding
B. Using a cell phone while driving
C. Getting wrapped up in thoughts or emotions while driving
D. Driving with bad brakes
E. Both B and C


WHAT ARE THE TWO MAIN TYPES OF DRIVING HAZARDS?
Distracted driving and bad weather conditions
Human error and dangerous conditions
Reckless driving and busy intersections
Driving under the influence and aggressive driving


ACTIONS CONSIDERED TO BE DISTRACTED BUS DRIVING INCLUDE
A. Speeding
B. Using a cell phone while driving
C. Getting wrapped up in thoughts or emotions while driving
D. Driving with bad brakes
E. Both B and C


CHOOSE THE RULE OF DEFENSIVE DRIVING.
When you drive you should look straight ahead
You can expect that other drivers will correct your mistakes
You should stay alert with your eyes moving
You should make sure that you can avoid an accident at the last moment.


WHICH OF THE FOLLOWING TYPES OF MEDICATIONS ARE POTENTIALLY DANGEROUS IN A DRIVING SITUATION?
Prescribed
All of the Above
Over the Counter
Herbal Supplements

Annexe 8 Professional bus training development guideline.

<table>
<tr><th>No</th><th>Strategic activities/ steps</th><th colspan="2">Element /aspects/factors</th><th>Remarks/evidence bases</th></tr>
<tr><td>1</td><td>Consider in big pictures - identify the root cause of performance issues and address the situation or need appropriately.

-root causes of performance gaps.</td><td colspan="2">-physical Resource; tools, materials, technology, equipment’s, and funding.

–Structure/process; managements port support, quality inputs, logical processes, sensible policies.

–Information; feedback based on truck survey and fundamental data.
–Knowledge; the type of training required as discussed based on levels BUS drivers and requirement. Example training job aids, coaching, mentoring etc.

–Motives; generate a business tool for profit sharing, recognition, performance-based payment, benefits, job security, the prestige of position opportunity for advancement (Ethan S. Sanders and Sivasailam “Thiagi” Thiagarajan, Performance Intervention Maps. © ASTD. American Society for Training & Development. Adapted from a study by Peter J. Dean, Martha R Dean, and Rebecca M. Rebalsky)</td><td>- Learning is most effective when the trainees realize that they can fulfil specific needs through training (Obisi 2001).
–An example of negative reinforcement will be a demand for an employee to repeat a training course due to poor performance at initial training (Mamoria 1995).
– people learn faster when informed of their accomplishments (Leibowitz, 1981)
- Information’ for an evaluative dimension on MeBeSafe project. As pointed out by Karlsson et al. (2017: p.58).</td></tr>
<tr><td>2</td><td>Get the Assessment and Design Right.
– ADDIE is the most widely known and used instructional design framework, helping earning and performance professionals design and deliver the most effective training solutions</td><td>phase</td><td>Description</td><td rowspan="3">-Best practice applied in fleet organization study;
-Technologies for safety interventions and assessment of their effectiveness in the i-DREAMS project (IDREAMS.2020)

- “Export evaluation study on the effectiveness & improvement of the EU legislative framework on the training of professional drivers” by Panteia in 2014- Wåhlberg and Göthe (2007: p. 2), studies examining the effect of eco-driving training overall report effects in the range of 10 to 15% reduction - RUE-project (www.cieca.eu and Schulte et al., 2014; Weiße et al., 2015), on developing the competence-based of Goals for Driver Education (GDE) Matrix.</td></tr>
<tr><td></td><td>Analysis</td><td>Sometimes called “Training Needs Assessment,” Analysis includes:
- defining, identifying organizational and individual.
- identifying skill/knowledge requirements
- determining the level of instruction needed based on performer analysis and
- creating an evaluation strategy for the training</td></tr>
<tr><td></td><td>Design</td><td>Creation of a training strategy that includes:
- learning objectives for each competency/task
- teaching purposes for each competency/task
- assessments/tests to show mastery of the studies - sequence and structure of topics and lessons - selection of instructional delivery media/method</td></tr>
</table>

		Development	Production activity that includes the development of - participant learning materials (workbooks, practices, case studies, programmed e-learning) - facilitator guides (where appropriate) - visual aids (wall charts, PowerPoint slides, etc.) - Test of materials (pilot test).	Brocket al et. (2007)-the effectiveness of track-based practice for commercial heavy vehicle drivers smart' driving principle of Young et al. (2011)
		Implementation	We are putting the training into action, including: - An implementation plan for conducting the training - conducting the training.	
		Evaluation	Review and revision, including - Review and evaluation of each ADDIE phase to ensure it is accomplishing what it needs to - evaluate the instructional effectiveness of the training through assessments, observation of performance on the job, and measurement of organizational impact. - Revision of the training system.	
3.	**Integrate the Essential ELearning Design** -decision of using the online tool based on its environment for training. -Use friend to trainers and trainees	E-Learning Design Components: -Motivation -Learner Interface -Content Structure and Sequencing -Navigation -Instructional Interactivity. A strategic approach should answer why and what will then lead you smoothly to the how.		Schulte et al. (2014: p. 47 Baten and Bekiaris, 2003) argue that learners use CBT or WBT to assimilate contents. Lang et al. (2007: p. 44-50; Brock et al. (2011)) proposed a classification of multi-media tools the level of interaction between the user, the instrument, and the task required by the user in the TRAIN-ALL-project.
4.	**Use an Engaging Training Model**; developing a training session or program is easy to apply and allows for many variations	Participants existing knowledge and skills and maximizing engagement are two critical keys to training success. To ensure your training accomplishes this, consider using a proven training model. The primary parameter used in this stage are; Rationale, Objective, Activity, Evaluation and Feedback (confirming or corrective)		Adapted from Harold D. Stolovitch and Erica J. Keeps's Telling Ain't Training. Bekiaris et al.2009: p. 42) stated that: "[t]he simulator-based training curricula TRAIN-ALL project

5.	**Plan for Evaluation**; Best Practice Plan: for Evaluation. Measuring learning impact is critical in training and development; - Do your senior executives understand the result of your learning and development efforts?	**LEARNING VALUE CHAIN**	ProfDRV-project on the implementation of Directive 2003/59/EC" in 2010-2013 (www.project-profdrv.EU) Rolim et al. (2016) where 40 drivers received delayed feedback (weekly e-mail report) on six eco-driving indicators over three months. Gent et al. (2019) focus in this report is given not only on the potential of persuasive feedback in a pre-or post-trip.

Level	Measurement Focus
0 Input	Input, such as volume and efficiencies
1 Reaction & Planned Action	Participant satisfaction and captures planned actions
2 Learning Changes	Changes in knowledge, skills, and attitudes
3 Application	Changes in on-the-job behaviour or action
4 Business Impact	Changes in business impact variables
5ROI	Compares project benefits to costs

Source: Adoption of best practice stage conducted by American Society for Training & Development (ASTD)