TRAFFIC RULES: AN ANDROID BASED APPLICATION FOR CHILDREN

A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF APPLIED SCIENCES OF NEAR EAST UNIVERSITY

By
ALI MAETOUQ MASOUD IFZAZNAH

In Partial Fulfilment of the Requirements for the

Degree of Master of Science

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

This mobile application was developed for education purpose and it will only be used within the scope of this thesis, this is to certify that i will not gain any commercial benefits from this application.

Name, Last name:

Signature:

Date:

ACKNOWLEDGEMENTS

To my lovely family…

ABSTRACT

In the competitive society, there are many changes occurring in the world and the parents are not dedicating their time for the children's learning purpose. Moreover, the smartphones and tablets are ruling out the world in the current time and technology is progressively trendy in these days across the world. The development of the new technology that manages the smartphones and tablets are becoming the growing one in the education field. Today, many types of research show that the education and the technology are vital for human beings and they reliably provide the good education platform to the children's. In recent years, mobile applications and games market has thrived in mobile world and some of these applications and games are particularly designed for children's learning. Numerous studies are done on children's learning through mobile applications, Children's preferences, parents, concern and customized application designs that must cover children's preferences are the major factor to been in these studies; however, there are a limited number of studies that have specifically focused on traffic rules. The purpose of this study is to provide children's a mobile platform where they can interactively learn about traffic rules and road safety. After a market search a few of relevant applications have been found with similar purpose but there were some gaps to be considered. The design of this application differs from rest of the applications in terms of simplicity, more attractive graphics with continuous instruction and support for children's user interface design principality. The quiz section in this application is more fun, it boosts Children's interest learning and in overall, the developed application is interested for children's and parents. The developed mobile application provides a complete guidance for children of all age levels and the quiz section in particular is effective at catching children's attention and increasing their motivation towards learning traffic rules.

Keywords: mobile application; mobile devices; Android; traffic rules learning; children

ÖZET

Rekabete dayalı dünyada çok değişiklikler olmakta ve ebeveyinler zamanlarını çocukların öğrenimine ayırmamaktadırlar. Bununla birlikte, akıllı telefonlar ve tabletler şimdiki zamanda bayağı moda olmuş durumdadır, Yeni teknolojiye dayalı akıllı telefonlar ve tabletler, eğitim alanında da büyük katkılar yapmaktadırlar. Günümüzde, teknoloji ve eğitim alanında yapılmış olan çeşitli araştırmalarla çocukların eğitimleri için iyi bir platform oluşturduğu kanıtlanmıştır. Son yıllarda mobil uygulama ve oyun pazarında çocukların eğitimleri için çeşitli uygulamalar ve oyunlar görmekteyiz. Çocukların mobil uygulamalar sayesinde öğrenimi için, çok çeşitli çalışmalar yapılmış ve bu uygulamaların çocukların tercihleri doğrultusunda olmasına önem verilmiştir. Fakat, çocukların trafik kurallarını öğrenmeleri üzerine kısıtlı sayıda çalışma yapılmıştır. Bu çalışmanın amacı, mobil ve interaktif bir uygulama sayesinde çocuklara yol emniyetini ve trafik kurallarını öğretmektir. Yapılmış olan pazar araştırmasındar sonra bu konuda sadece birkaç tane uygulama bulunmuştur ve bunların da bir takım kısıtlamaları olduğu gözlemlenmiştir. Tasarımı yapılmış olan bu uygulamanın mevcut diğer uygulamalardan farklı şu özellikleri bulunmaktadır: Basit kullanım, daha çekici grafik kullanımı, çocukların kullanımı için sürekli yardım ve destek. Uygulamanın soru bölümü ise oldukça eğlencelidir ve çocukların ilgilerini çekip öğrenmelerine yardımcı olmaktadir. Sonut olarak, tasarımı yapılmış olan bu uygulama hem ebeveyinlerin ve hem de çocukların ilgisini çekmektedir. Bu mobil uygulama her yaşta olan çocuklara tam bir yol göstermekte, ve özellikle soru bölümü çocukların dikkatlerini çekmesi bakımından oldukça etkileyici olup trafik kuralalarını öğrenme yolunda onların motivasyonlarını ortıracağı düsünülmektedir.

Anahtar Kelimeler: mobil uygulama; mobil cihazlar; Android; Trafik kuralları öğrenme; çocuk

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LIST OF ABBREVIATIONS

DBR: Design-Based Research

E-Learning: Electronic or Online learning

IDE: Integrated Development Environment

JDK: Java Development Kit

ML: Mobile Learning

OS: Operating System

SDK: Software Development Kit

UI: User Interface

CHAPTER 1

INTRODUCTION

1.1 Technological Development

In the modern world, technology has continued to grow rapidly and provides numerous benefits to individuals. It is now considered to be crucial in the daily lives of individuals and provides advantages to make life more productive; with the advent of new technology, everything is now more convenient and accessible across various sectors. Computers and laptops are considered as the traditional tools that can transform people's lives. Furthermore, it not only provides entertainment but also gives new power to individuals who can use mobile application in a simple manner without any difficulties. People are now equipped with smartphones, tablets, along with several applications and software that enable them to access and interpret data for their different purposes. The demand for mobile phone and computer applications is constantly increasing. It represents the most effective method to learn different things using the technology due to its cost effectiveness and ease of use (Jeng et al., 2010).

It is the most effective platform for people around the world and the use of mobile applications improves knowledge and skill levels in various ways. Children can receive the greatest benefits in this current scenario because their parents have the capacity to teach them with the assistance of mobile applications. Mobile applications can provide numerous benefits to a child's education. Mobile applications also play important roles in individuals' lives. Today, everyone has access to mobile technology and they have the ability to download a variety of mobile applications for different purposes (Uzunboylu et al., 2009).

New generations are being raised in an environment where they can study with the help of computers, mobile phones, and other smart devices. Children are incorporating modern technology into their lives as it facilitates the process of learning different things about the world. In this way, the technology is considered to be second language for people. Indeed, the younger generation are perceived to

benefit from new digital technology as they have the capability to access information quickly using their smart devices. They can now instantly access many things from around the world within a second using smart technology. With a smartphone device, they can interact directly with friends and family members across the world by chatting or making video calls. Through the usage of these technologies, children become motivated to use different applications and to discover more things for their studies.

1.2 Technology, Education and Mobile Applications

Technological developments are integrated into modern education and have enabled people to increase the educational possibilities for their learning purposes. Technology has delivered greater efficiency and effectiveness in learning and it provides the opportunity for improved personal development (Lan et al., 2009). Exposure to technology creates better methods of collaborating and communicating. Technology is the most important and valuable tool that facilitates the rapid access of information. With the help of modern technology, people are able to achieve successful results in their Internet searches. For instance, the majority of applications and platforms have started to develop new features for children and students (Pınar & Oğuzhan, 2015).

Today, students always adopt new technologies for their learning purposes. However, the technology can present certain drawbacks and finding methods of overcoming these problems can be extremely simple. From this technology, the student has the ability to think about their current approach to education.

The American Academy of Pediatrics (2012) recommends that children can begin to use smart technology for their learning habits around two years of age. These apps are acquired or purchased by the American Academy to explore innovative ways of learning.

The Campaign for Commercial Free Childhood (2013) filed a complaint against the Baby Einstein Company regarding their videos. The claim asserted that particular young children were not made smarter by using this technology. However, when used appropriately, the innovative technology can make life easy and work can be been done within a second using less effort. With the rise of the new technology,

many things have been changed in the world. This is now a good source for education and building children's capability to develop their knowledge in a simple way.

There are currently efforts to realise consumer refunds nationwide across the world and the commercial-free childhood campaign exists with the aim of pursuing this accusation against the mobile application companies. This company has also challenged open solution toy companies such as Baby Hear and Read and Baby's First Puzzle. Parents generally believe that such applications can advance their child's learning children in an effective manner (Boog, 2013). Not only that, they attempt to provide benefits to the parents and can they teach their children in an appropriate manner.

Sandels (1968) indicated that various studies have affirmed the children's lack of control over their attention, temporary instincts and decision making abilities. Furthermore, they experience difficulties in understanding all aspects of traffic rules. In comparison to adults, who have the ability to base their actions on vehicle and road sounds; children find it difficult to concentrate on these aspects simultaneously? Children have narrower visual fields and decreased judgement in regard to oncoming traffic. Therefore, teaching traffic rules at a younger age is more beneficial than for older people. Due to their lack of judgement and instant decision-making capabilities, it is of significant importance that children are taught effectively about road safety and traffic rules.

The Founding Director for Campaign for the Commercial-Free Childhood Susan Linn (2015) stated that modern children need healthy brain development for the purposes of active play. Active brain development is particularly important for the children to enhance their skills that they will apply in various aspects of their lives. This can be highly beneficial for the children when they are faced with different challenges as they move into adulthood. Creative play and face-to-face interaction are helpful to enable them to overcome challenges simply in their lives. Kathleen Alfano, the Senior Director of Child Research for Fisher Price, emphasised that the development of new applications reveals that the companies is now generating revenue from developing appropriate toys for the children to play in a very simple way. This demonstrates the growth of the development in the education field and the

company is now extending its extensive research into play items into the field of digital technology. In the present scenario, there are many new applications that are specifically designed for children's learning. There are various developments happening around the world, and software developments are activating the development of mobile application due to the growth of technology (Boog, 2013).

As aforementioned, there is an abundance of applications that are specifically designed for children's learning needs. The development of software that operates on smart devices is now an expanding area of research. Additionally, it can observe that children are exhibiting increased interest in interacting with electronic devices. Thus, the major aim of this study is to develop an Android-based mobile application to teach children traffic rules.

1.3 Problem Statement

Education is of significant importance for both children and adults and the children's minds are constantly thinking of new things. Technology is rapidly producing new innovations for people and the children in particular, and this field is rapidly expanding. Parents now consider selecting Android-based applications for their children's learning purposes. Consequently, children can improve their learning performance and can access different things while searching in the online environment. Android for education is not an entertainment tool and it can be highly beneficial for to improve skills and knowledge in different areas. Children require sensitive minds to retain different things in their minds. With the help of the advancing technology provided by laptops and computers, individuals can now reap many benefits. Technology presents a new method for parents to improve their children's learning skills and much more for their future requirements and parents seek to achieve admission in a reputable school that is appropriate for their child's education. In order for a child to be successful in their education, the school environment plays a vital role in the child's academic development. Hence parents aim to approach this in a cautious manner without any disturbances. Education development is a very helpful domain for parents to provide many developmental influences regarding their children's education. However, parents must consider the dynamic interaction of the education development for their child's education (Priyankara et al., 2013).

There are various reasons present behind the development of software in the mobile industry, which indicates that parents prefer mobile application development for the purpose of their child's learning and future educational needs. Using modern technology, children also interact with their electronic devices and have the ability to open accounts in social media networks. The main aim of this study is to show how to develop an application that is suitable for children and that can be beneficial for children learning traffic rules and regulations. In the literature, it is found that there is a deficiency in the number of mobile applications designed to teach traffic rules to children.

1.4 Purpose of the Study

The aim of the study is to develop an Android-based mobile application which is specifically designed for children (9-11 years old) to learn traffic rules English a second language. The application will be based on various colourful content, images and sound effects that will catch children's attention and help them to learn with a sense of enjoyment.

1.5 Significance of the Study

The developed mobile application differs from other applications in various aspects. The application covers many sections related to traffic rules and, more specifically, it is an application based on the globally used English language. It contains sound and graphical images and instructions to guide students at each step.

1.6 Limitations of the Study

The following are limitations to this study:

- This study will be limited only to children between (9-12 years).
- Most history has been collected from mobile application developed and Android projects and reports.
- Due to the lack of semester time, the research was a summary of fewer objectives. Research began in the spring semester of March 2017 and was completed in July 2017.

1.7 Overview of the Thesis

The study consists of 5 chapters:

- Chapter 1 presents the introduction, technology development, technology education and mobile application, problem statement, purpose of the study, signification of the study, limitations of the study and finally, overview the thesis.

- Chapter 2 is based on a detailed literature review that covers various applications developed for children learning traffic rules importance and parents' attitudes towards children using mobile applications.

- Chapter 3 demonstrates the methodology adopted to develop the application include: Pre-Design operations, software environment, developed mobile application content, application development period, application testing, application features and process and flow chart.

- Chapter 4 describes the application and identifies its uses, processes, and benefits. It includes a welcome page, activity page, traffic lights, traffic codes, traffic scenario, competition section and safety tips.

- Chapter 5 summarises the study with a conclusion and appendices.

CHAPTER 2

RELATED RESEARCH

The use of mobile devices and the development of Android applications have influenced the life of each individual today. Apart from the purposes of communication and entertainment, these applications also provide interactive learning platforms for adults and children. In terms of children's learning, there are various factors to be considered, including the parents' concerns, the child's behaviour, and interactive designs to boost their interest. Thus, this section of the thesis presents a detailed literature review that will be utilized to achieve the goals of this study.

2.1 Traffic Rules and Children

Unfortunately, children are not sufficiently mature to take instant decisions in the same manner as adults, as stated by Sagari (2017). She further added that children do not know what to do and what not to do while walking or crossing the road. Without the guidance of parents and proper knowledge of road safety, children can risk their lives. In a report issued in 2014 by the National Highway Traffic Safety Administration (NHTSA), it was revealed that 3% of children died due to road accidents, with 480 children injured every day in 2014. A fact that is more severe and disturbing is that approximately 200 out of 4,000 people pedestrians killed in road accidents were children.

Sandels (1968) indicated that various studies have affirmed that children have a lack of control over their attention, temporary instincts and decision-making abilities. They face difficulties in understanding various aspects of traffic rules compared to adults, who find it easier to make decisions based on vehicle and road sounds, whereas children find it difficult to concentrate on these aspects at the same time. Children have narrower visual fields and exhibit poor judgement when traffic is concerned. Vinje (1981) and Blades (1997) supported the views of Sandels and affirmed that numerous studies claim this statement to be true. They further added

that, due to children's limited perceptual capability, they are at considerable risk in traffic situations.

Three to six year old children were observed by Valdimar and Hans (2000). In their research, they categorized traffic situations into multiple options. First, they used a traffic model, where they used toys and dolls to demonstrate the movement of children on their way home to observe how careful they were while crossing roads. One hundred and thirty one children participated in their research and all the children were tested by placing them in model situations to assess their understanding levels towards safety and safety devices and also their response and behaviour while crossing roads.

Secondly, they used task-based scenarios with three components:

1. Zebra crossing
2. Stop sign control
3. Car movement

In order to analyse this scenario, a subgroup of 47 children was taken into account. This situation was called a road-side situation. The results of this investigation revealed that age, knowledge and the understanding of traffic rules are the important factors. This test showed a different facet of children's behaviour towards traffic situations.

In their study, Ampofo-Baoteng and Thomson (1989) discovered that, at an early age, children have a very limited number of cues and decision-making skills. They are unable to evaluate road traffic situations or the absence or presence of passing vehicles. A study conducted by Demetre et al. (1992) indicated opposite findings to previous studies and discovered that children's capabilities while crossing roads can by characterised by careless or spontaneous decisions. Additionally, they suggested those children's uncertain decisions about traffic gap acceptance as well as road safety and other major traffic rules more frequently leads to lapses. They stated that it occurs due to children's lack of attention rather than from deficiencies in timing. Indeed, most of the studies regarding children's contact with traffic have concluded that, due to their limited cognitive abilities, children are not expected to be able to

independently cope with the complex situation and environment (Ampofo-Boateng & Thomson, 1991; Cosgrove, 1985).

2.2 Mobile Applications and Learning

Access to information has become easier and more convenient in the modern era due to the rapid development of wireless network technologies. There are now numerous mobile technologies that enhance how people access information virtually. In recent years, advanced technologies have been developed that have facilitated e-learning and m-learning easier and some of them incorporate wireless technologies, high bandwidth wireless communication networking infrastructure as well as advanced hand-held devices. Currently, the traditional modes of learning are being complemented by electronic applications (Sharples, 2000). Unfortunately, mobile devices have various limitations, such as that their screen size is limited as well as other limitations including battery capacity, computational power and input interface and network bandwidth (Chen, Chang, & Wang, 2008). In line with these limitations, there have been questions over how users can enhance the service delivery when using mobile devices for learning purposes. Resultantly, several researchers have sought to find solutions to these challenges from a different perspective (Lemlouma & Layaïda, 2003).

Recently, there has been significant publicity over how mobile learning devices have revolutionized the learning environment (Rogers et al., 2005). In this instance, the learning situation entails learning at the right time, place using resources with complete support systems. In order to achieve this, it has become mandatory to achieve a context-aware and seamless learning environment. This can be realised through the use of computing apps and devices that sense information about the users depending on the context, such as GPS, wireless communications RFID, specific sensors, and contact-less technology, smart cards and wearable devices (Hwang, Tsai & Yang, 2008).

The Android operating system has been used in smartphones to create many mobile applications that are related to the field of education. Mobile applications can also provide a patient's health records and medical images (Doukas, Pliakas & Maglogiannis, 2010). Today, many adults download e-books for their studies and

even have the capacity to design their own apps within a short time due to the expansion of technology. In fact, the technology has also developed to support mobile application processes and to improve the reliability of the children's educational performance. The mobile applications are reliable as they reduce human error and provide reliable performance in the education platform (Bin & Lun, 2001).

William et al. (2006) demonstrated that the dynamism in technology can be used in order to train and to obtain different learning strategies. Education is an important period for children, as they have the opportunity to learn many different things in their developmental stages with the help of mobile applications. Developer firms or other companies who develop mobile applications have developed uniquely designed applications focused on learning environments for children. It is the mainstream technology that stimulates the student's interest and this is helpful for the students to fit into the education with the innovative technology. ICT facilitates access to the students by learning and improving the motivation in the educational platform. This is also beneficial for the students as it develops a sense of self-competition and improves the confidence and self-esteem in the process of educational development (Thomas, 2007).

A positive experience is created for the student by altering the natural knowledge and skill and focusing on the experience of learning via mobile phones. Mobile applications provide a wide array of educational and learning materials to students in a highly appealing manner. This offers the best options for parents to choose the information that is useful for their children and to enhance the quality of knowledge and skills in a simple manner. These applications motivate and guide the children to learn in an appropriate manner or from a suitable device (Chen & Li, . 2010).

Mobile devices now offer smart educational applications, which encourage the children and focus their complete attention on the educational field. This is predominantly for improving their problem-solving abilities but also improves memory power, and reading and writing skills in a smart way. Mobile learning has the potential to accommodate a wide range of features and sections, which create a quality learning experience. Using mobile learning, the students can experience a problem free environment while preparing for exams and other things in their life. This is also considered to be a stress-free management of educational development.

The design and layout of a mobile application can reduce the level of confusion experienced while studying and can be beneficial when studying or looking for information sources (Roxani et al., 2013).

El-Bishouty, Ogata and Yano (2007) proposed the Knowledge Awareness Map. It is a tool that creates a personalized learning environment to learners, depending on their specific needs and physical location. It also recommends some of the most appropriate materials that suit the learners' objectives and immediate location. Tan, Liu and Chang (2007) designed the Environment of Ubiquitous Learning Educational Resources (EULER). It assisted learners to observe learning objects as well as to share some learning experiences with their fellow students. Chen and Hsu (2008) believed that a personalized mobile learning system would be the ideal scenario. It could use fuzzy Item Response Theory complete with English news articles and vocabulary that aids the process of learning.

2.3 Mobile Applications for Children's Learning

Research has been conducted on this aspect, where authors have developed, analysed and tested applications for the purpose of children's learning. Stefan and Wolman (2009) noticed that children are attracted by the different aspects of the current technology. In order to design mobile applications for educative purposes, the parents must consider the positive aspects for the child's study and future life. The parents must choose an application that does not harm their children and does not produce negative effects. Therefore, choosing the best application for pre-school children and is very important as they are very sensitive at this stage. Many applications have been developed for children's learning and some of them are mentioned below:

Priyankara et al. (2013), in their study, proposed a mobile-based children's Training e-Learning System (KTeLs). It is a learning tool that facilitates self-learning in preschool children. It is based on a strong theoretical foundation and allows children to develop cognitive and psychomotor skills, such as drawing, writing, recognition of numbers, basic shapes and colours and logical thinking. At present, Android is developing at high speed and is being widely applied to embedded devices, becoming the most popular operating system for smartphones.

Couse and Chen (2010) investigated the use of tablets among children aged 3 to 6 years old. They integrated the use of tablets into the classroom curriculum in order to analyse the impact. Apart from the lack of familiarity with tablets, students showed rapid interest in using devices, avoiding all technical complexities. However, during individual observations of the 41 children during a drawing lesson, the authors found a higher interest rate and engagement with education among the children. Moreover, the interviews conducted with teachers regarding the same scenario revealed that children did a surprisingly good job in the drawing task compared with the traditional way of drawing.

Kirci and Kahraman (2015) focused on a mobile application that would enhance learning and assist children with sharpening their basic skills, such as reading comprehension, short-term memory, orthographic coding and mathematical problem solving.

It is important to note that the landscape of media targeted at children has experienced a number of changes in recent decades. However, the release of an original policy statement did not address all the concerns. The market for screen-based electronics intended for children has expanded rapidly. For instance, the demand for children's tablets has risen significantly. However, a report published in 2011 revealed that screen-based media has some negative impacts for young children (AAP, 2011).

Recently, it has been revealed that more than 75% of children aged eight years and below now have access to mobile devices, particularly tablets and smartphones (Common Sense Media, 2013). Hence, AAP's concerns are genuine, as parents also report problems when children use of mobile applications is overly intensive. Other parties who have raised concerns include early childhood educators and health professionals. Dyslexia is a serious learning disability that adults as well as children experience. Research in this domain has been conducted to determine the advantages of using Information & Communication Technologies, particularly for children with learning difficulties. For example, Roxani et al. (2013) predominantly focused on developing a mobile application for children and adults with disabilities. This is helpful for them to improve the learning skills and knowledge in reading comprehension, coding, and short-term memory, among others. They paid particular

attention to designing the application in a manner that provides students with a more stimulated and interactive platform. The "EasyLexia" applications show that the environmental setup, design choices, and results of the mobile learning hold these things in a simple way.

Dundon et al. (2013) conducted studies to determine the efficiency of two apps to facilitate communication among autistic children. They determined that using many reinforcement techniques and iPad apps could ease the communication process (specifically My Choice Board and Go Talk Now). It could also improve the communication abilities of such children. Sandvik, Smørdal and Østerud (2012) believed that with guidance from the teacher, kindergarten children learning in a multi-lingual and a multi-cultural learning environment are more likely to learn effectively when working together using an iPad and can complete many learning activities when compared to those who are not issued with iPads.

Shular (2012) reported that technology plays the most significant role in child learning applications and is associated with the Cooney Center for advanced children's learning. They conducted action research to achieve research objectives and the participants in this process were experts, teachers and children. They affirmed that mobile apps are rapidly emerging as a new trend in technology and provide the educational material to the children in a popular and well-known form.

Lee (2015) launched a project which involved young children from the lower economic class in learning using digital media. The children engaged in the study were aged between 3-5 years. The project was designed to trace how iPads are used in pre-school education in the United States of America. The project encompassed tutorials on how to craft an early childhood curriculum. Other aspects included planning a lesson and examining how children learned before the project started as well as after it was completed. This raised concerns over how early childhood teachers and professionals coach young children to learn fundamental concepts. It also sought to determine how teachers can make the learning experience enjoyable and relate it to the culture, needs and interests of the school as well as that of the learners. Digital media is now gaining significant favour in the learning environment.

CHAPTER 3
DEVELOPED MOBILE APPLICATION

3.1 Pre-Design Operations

Design always remains a challenging factor when it comes to of the production of applications specifically for children. Thus, prior to designing the application, the following procedure has been applied:

3.1.1 Application Requirements

The application needs and relevant data gathering was a fundamental approach. As discussed earlier, the application has been designed based on previous methods and strategies as well as children's views collected via participatory research. The study accomplishes the following objectives:

- The need and importance of learning applications.
- Providing children an interactive and easy application.
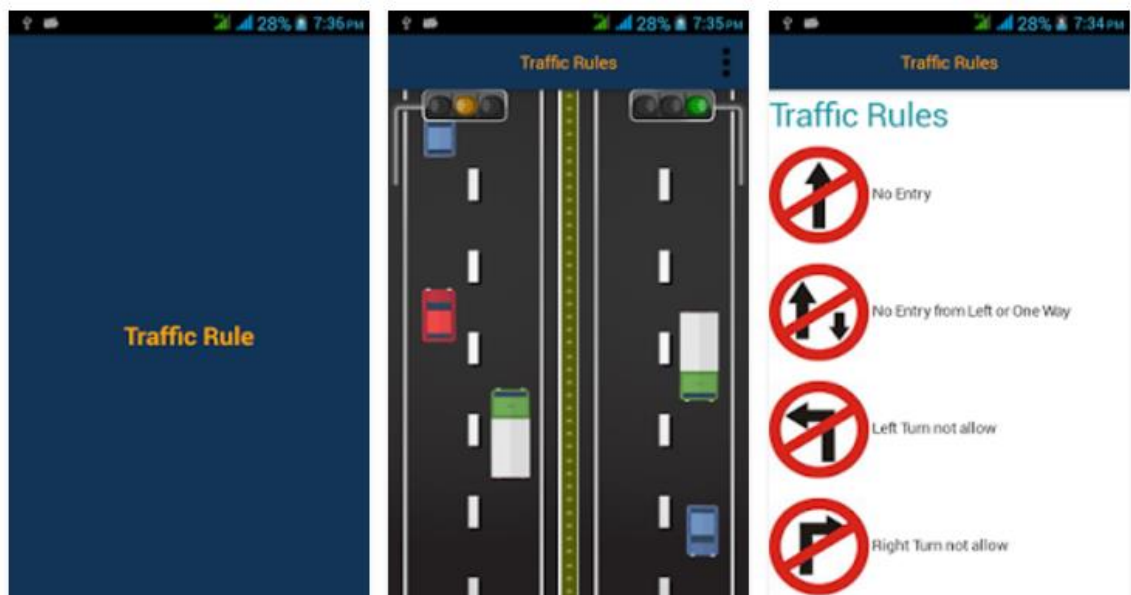- Helping children to learn about traffic rules and safety.

3.1.2 Market Research

According to Becky (2016), market research is an essential step in designing an application. Thus, based on the market research for this study, it has been identified that there is significant demand for applications focused on children's learning. The existing applications for learning traffic rules are not particularly effective and do not cover sufficient content. There is not enough mobile application to learn traffic rules to children who learn English as a second language. One of these applications is shown in Figure 3.1; it has a good interface, but it is only a demo version and was built as a magazine, and it is not available in an English language version:

Figure 3.1: Traffic rules magazine – Android app
(https://play.google.com/store/apps/details?id=com.whisperarts.kids.journal.demo00
09&hl=ar)

Figure 3.2 displays a picture of a traffic rules application for children; like the previous application, this application has limited content and it is also not graphically attractive. Also, there is no form of fun or game-based activity provided in the application.

Figure 3.2: Traffic rules learning point – Android app
(https://play.google.com/store/apps/details?id=com.trafficsignal)

Figure 3.3 illustrates a car game, designed to teach children about traffic lights. It is specifically aimed at helping children to learn about terrific lights; however, in this application, there is no additional learning resource added.

Figure 3.3: Traffic car game
(https://play.google.com/store/apps/details?id=com.olaolo.trafficlights)

Figure 3.4 depicts an application defining traffic signs for children. The content is too confusing and is intermingled with numerous graphical images, which can easily discourage children, leading to a lack of motivation towards learning. Too much content or a plethora of buttons decreases children's motivation levels towards learning.


Figure 3.4: Traffic signs match race kids
(https://play.google.com/store/apps/details?id=com.schwapf.trafficmatch.withads)

3.1.3 Mobile Application Design Model

There is some research that demonstrates how to achieve the design requirements for mobile learning with the help of a smartphone, particularly for the field of education (Sharples, 2000). In this thesis, the aim is to develop an Android based application that is specifically designed for children aged 9-11 for the purposes of teaching and learning traffic rules. The application will be based on various colourful content, images and animation affects that will attract children's attention and help them to learn in a fun environment. In this thesis, the application will be developed on the latest version of Android Studio. The development process will follow a system development life cycle approach that consists of design, development, implementation and testing phases. The study is not a primary study as it is based on previous synthesis related to Android application development; although the mobile application developed will have originality and will be specifically designed for children.

However, this design is based on existing research and covers all design requisites. A design-based research (DBR) model was used during the development process of this research. According to Reeves (2006) the term design-based is also known as development research. Considering this as well as the continuous design, development and evaluative nature of the research project, it was decided to ground the methodology for this project on the theoretical framework of DBR. Figure 3.5 shows the important elements and enhancement process of the participatory research approach.

The mobile application design consists of the following key attributes:
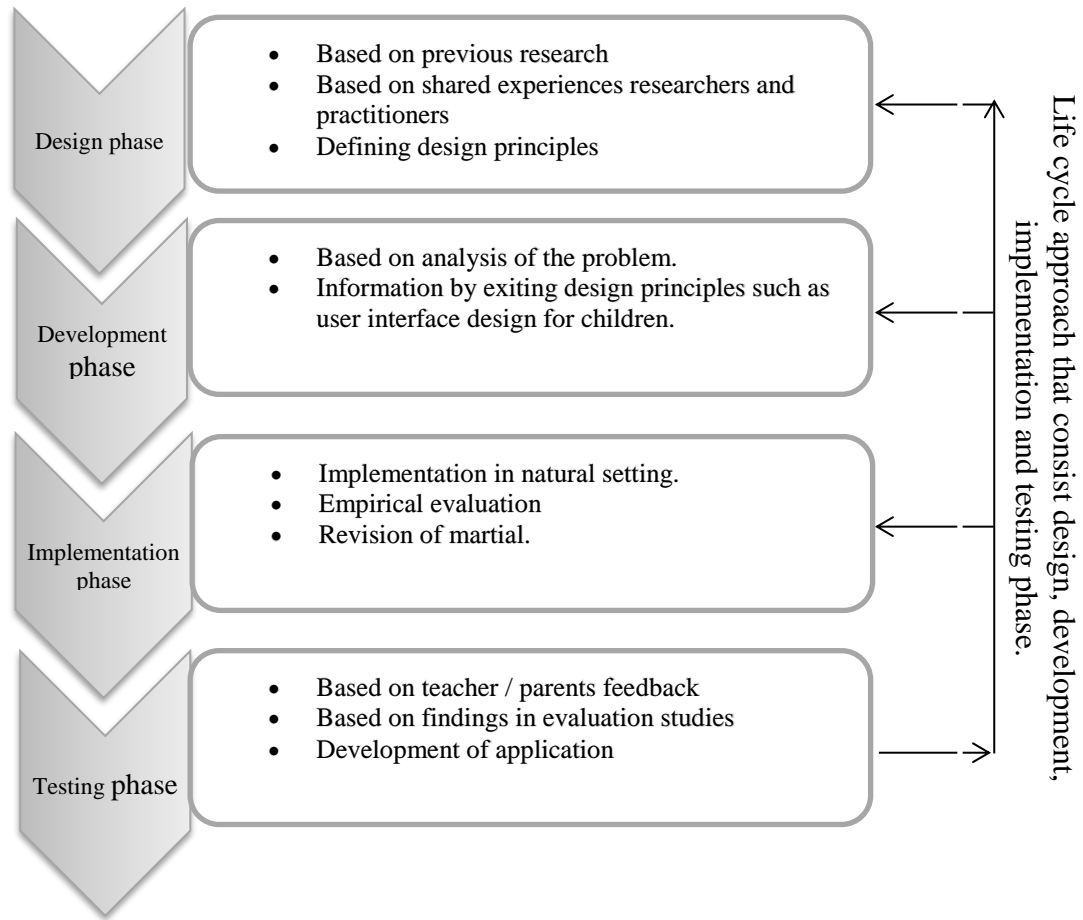
Figure 3.5: Design-based research model of the study

3.1.3.1 Age Group

Age is an extremely crucial factor when designing an application for children. For example, some age groups prefer to use applications on their own, while the rest need instructions to feel confident (Becky, 216). As stated by Chen (2010), a child between three to five years is considered as a pre-schooler and preschool children are confronted with managing the rapidly growing global technology trends. It is a challenging time for the parents as they must dedicate time for their child's learning; consequently, mobile learning is a suitable method for the pre-school children and the Children easily acquire the learning material. Carmichael (2011), in his research, discovered that 25% of toddlers are capable of using their parents' smartphones, while children in the 12 to 17 year age group own their own cell phones.

The targeted age group for this application is children from 9 to 11 years old, as this age group predominantly prefers to play outside and ride bicycles, for example. Children in this age group are sharp learners and prefer to do things independently without relying on their parents. At this age, they can easily use mobile applications, read content and play games.

3.1.3.2 User Interface

As stated by Frauenberger et al. (2012), an effective user interface (UI) plays a significant role in encouraging a child towards engagement and learning; a simple and easy to use platform requires less effort to learn how to use the application and ultimately increases the user satisfaction levels. A good user interface enables users to conduct tasks easily, encourages use, and most importantly, engages the interaction between the user and the device. Additionally, applications or programs which are easy to use require less effort to understand the functionality as well as training, which ultimately leads to the elevated user satisfaction and increased willingness to re-use the application. Visual supports and attractive graphics are some of the most effective tools to attract children and to facilitate the learning process (Muhamad et al., 2016). The user interface for this application covers all attributes retrieved from (White, 2016; Itzkovitch, 2012):

- **Colour:** Children are more attracted to colourful images. Thus, the developed mobile application is based on carefully adopted colours, which offer the highest appeal for users.
- **Buttons:** Button size should be compelling to ensure that children do not become lost within the application and know how to continue or easily go back.
- **Interactive Elements:** Interactive elements, such as images and sounds, build children's interest. A combination of images and sounds is used to reinforce messages to ensure that the application is accessible to all children, regardless of any disability they may have. Thus, the application contains numerous interactive elements to continuously build children's interest.
- **Instruction/Hints:** Becky affirmed that hints and instructions are mandatory features for educational applications. Thus, the application includes text

instructions along with audio versions of sound to ensure that there is better guidance for the children.

- **Icon and Menu:** Easy to use navigation such as the ability to screen swipe is more beneficial for young users. Therefore, the application includes a full-screen menu section with touch and swipe feature so that it can be easily navigated.

- **Voice Recognition:** This allows children to complete a function in the application or control the mobile devices through voice commands.

3.2 Software Environment

After detailed analysis, research, requirements and design and the application was finally developed. The Android application platform has been chosen and the application has been programmed on Android Studio.

3.2.1 Android OS

Android is one of the most common technologies that are used to enhance learning. It is operating software that is used to run tablets and mobile phones. Android remains the brainchild of the Open Handset Alliance, which is led by Google. The aim of the Android Open Source Project is to improve the mobile experience for its users (Android, 2011). Google's Andy Rubin (2010) believes that Android is "the first truly open and comprehensive platform for mobile devices, allowing all of the software to run a mobile phone but without the proprietary obstacles that have hindered mobile innovation." Figure 3.6 below shows the entire Android environment:
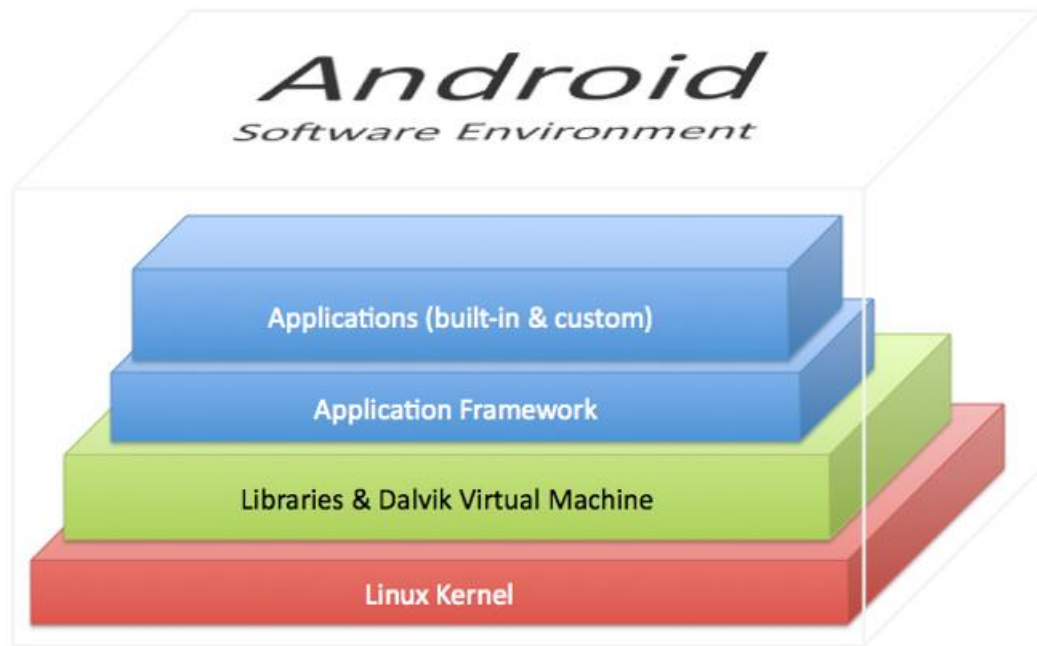
Figure 3.6: Android software environment
(https://c.slashgear.com/wp-content/uploads/2012/05/AndroidSoftwareEnvironment-661x420.png)

3.2.2 Android Studio

Android Studio refers to the official Integrated Development Environment (IDE) for the purposes of app development. It is based on the IntelliJ IDEA. IntelliJ has a powerful code editor complete with developer tools. The Android Studio has many features that allow developers to become more productive when building many more Android apps (Android Studio, 2017).

These include:

- A fast emulator that has many features**.**
- A grade-based system that is very flexible.
- Environmental unity to allow for the development of android devices.
- Instant run to enhance changes in the running app without the need for APK.
- High quality frameworks and testing tools**.**
- Integration between GitHub and code templates to enable developers to create a common app as well as to import sample cod.
- Lint tools are also critical to enable the achievement of performance, version, usability and compatibility**.**
- C++ and NDK support**.**

- Built-in support for Google Cloud Platform to enable integration of the App Engine and Google Cloud Messaging.

3.2.3 Java Programming

Java is the most commonly used programming language for many Android applications. In this case, the Android Software Development Kit (SDK) is the most preferable. Java language originates from Sun Microsystems. It is an object-oriented language, which is more preferable for Android development; hence, this application is developed in Java language.

3.3 Developed Mobile Application Content

The knowledge that children must acquire regarding traffic rules and road safety are carefully added to the application. The application is divided into the following categories:

- Traffic Lights
- Traffic Signs
- Traffic Scenarios
- Quiz Section
- Safety Tips

Each category covers sufficient information to help children learn about traffic and road systems for their future safety.

3.4 Application Development Period

The development duration for the application was between March and June, 2017. It took approximately four months to build this application. The majority of this time was dedicated to graphic design, content design and coding.

3.5 Application Testing

To test and evaluate the quality of the application, user testing was conducted to determine any errors in all aspects of the functional requirements. The reviews of the ten teachers were the most valuable input in the designed mobile application. After

the experiment with kids (under the supervision of their teachers) who participated to use our mobile application in Near East Libyan School during the developing process of mobile application, teachers also contributed their opinions based on their experience with children and most of the views were positive.

3.6 Application Features and Process

This section explains each interface of the application along with its need and use. Figure 3.8 below presents a clear picture of the entire application process. It displays how the whole application has been constructed. It starts with a home page, and then shows an activities page containing five activities. After this, each section under each activity is listed and the traffic lights activities contain green, yellow and red light lessons, which appear one-by-one.
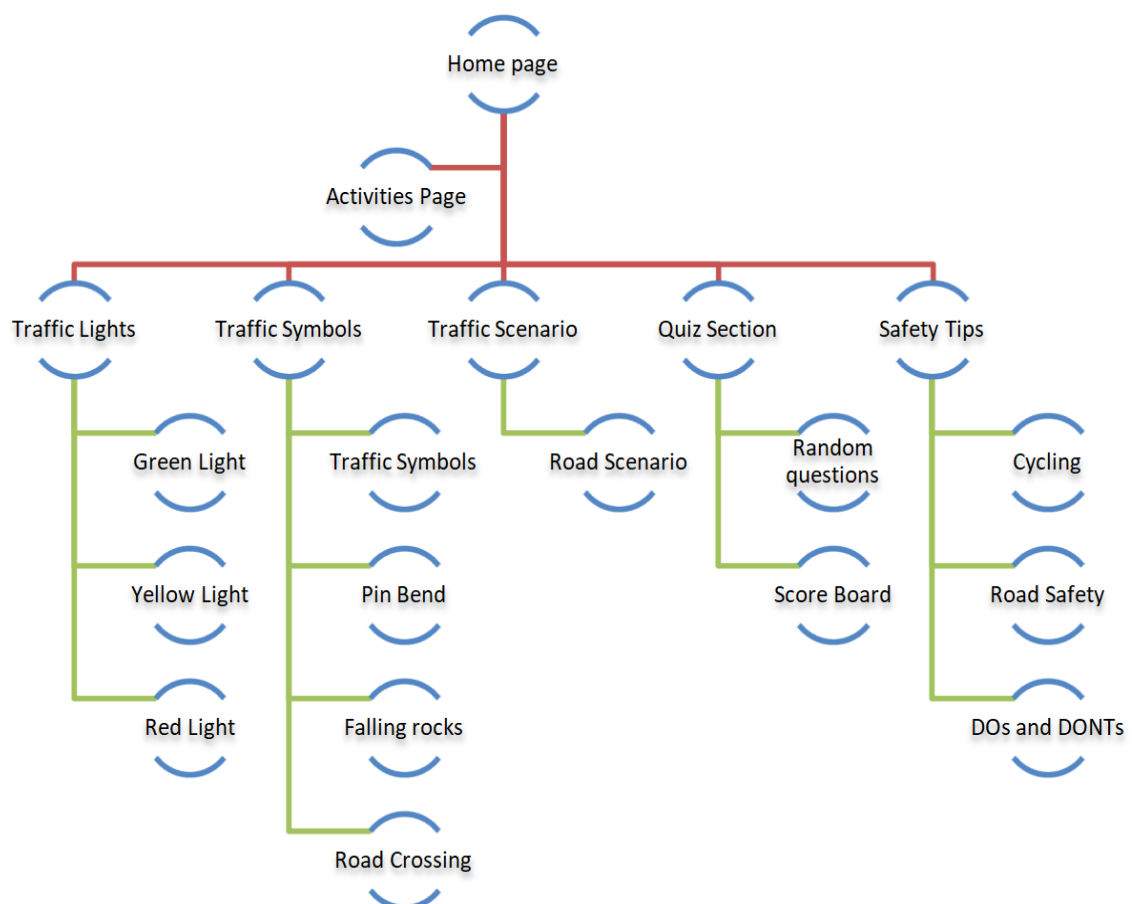

Figure 3.7: Application scenario of the developed mobile application

3.7 Sound and Image

Sound instructions are amended in every page and activity included in the designed application. For example the traffic symbols are more complicated to understand for kids. So rather than a long text, a sound instruction explaining each scenario is added the application. The sounds were designed with the text-to-voice by the author.

3.8 Flow Chart

The Figure 3.9 illustrates a general flow of the designed mobile application. The flow contains the welcome page which goes to the further pages such as activities page, traffic sings, traffic symbols, traffic scenarios, traffic quizzes and safety tips.
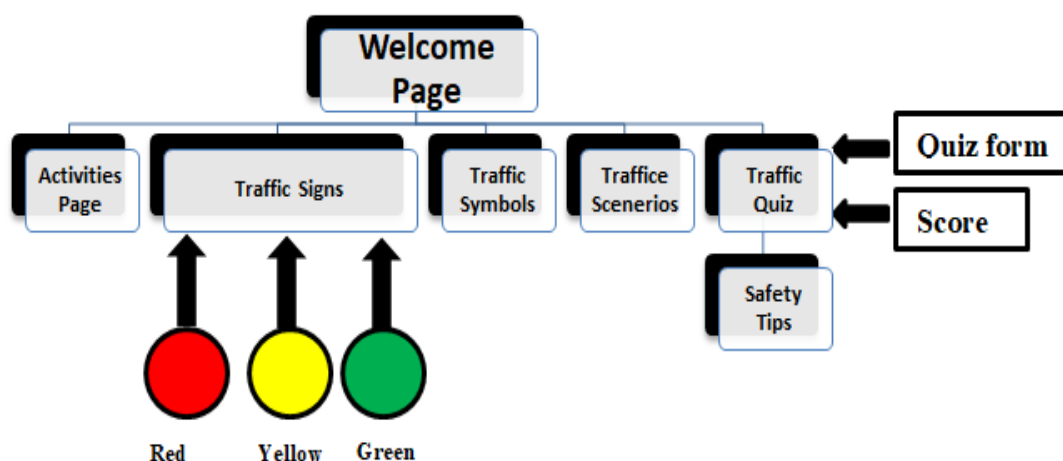

Figure 3.8: Cover information about the developed mobile application

CHAPTER 4
IMPLEMENTATION

4.1 Welcome Page

The welcome page of the application is shown in Figure 4.1 It is the first page, which carries the title of application "Traffic rules" and is an educational guide for children. Based on previous analysis, the welcome page contains a colourful image demonstrating a traffic constable holding a "stop" sign, along with some traffic lights and children passing by. The front page clearly presents a traffic learning message. A message at the bottom entitles the application copyrights to Near East University and the purpose of the application is also highlighted. This mobile application is embedded with a voice instruction which is mainly for people with upper limb and hand mobility problem/disorder, having to do with difficulties in performing gestures like pinch, spread and flick or tapping buttons and controlling sliding bars on the application in the mobile device. The solution to this is mainly to provide voice or speech recognition embedded into the application for the children's which gives a hand-free control of the mobile device.
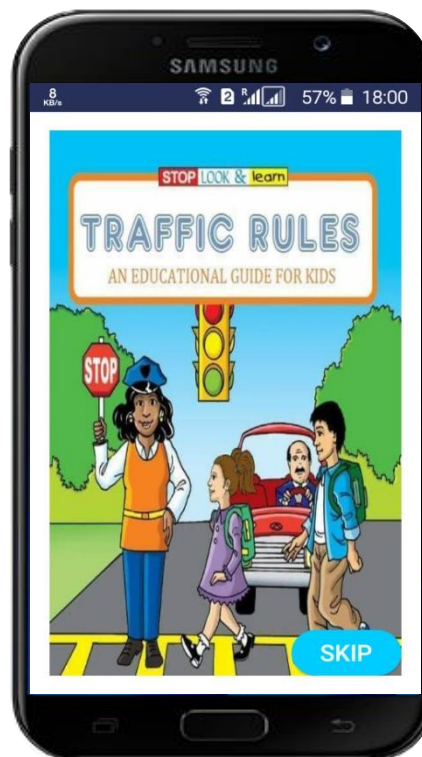

Figure 4.1: Welcome page of the developed application
(Image source: https://tr.pinterest.com/pin/217932069446582721/)

4.2 Activities Page

This is the second page containing the activities for children, which includes: Traffic Signs, Traffic Symbols, Traffic Scenario, Traffic Quiz and Safety Tips. A colourful background picture creates a relevant theme. A button sign along with a music symbol is basically an option button for sound and the home page. By selecting the respective activity option, children can easily enter that activity.
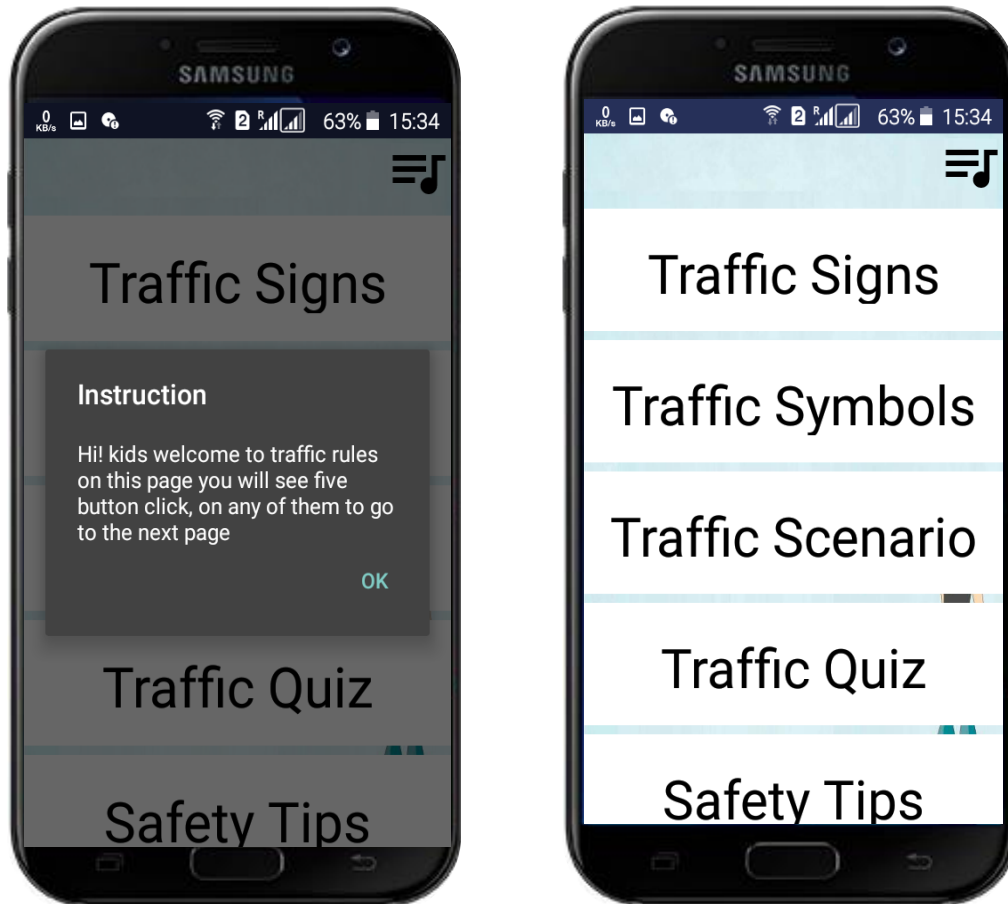

(a) Main menu   (b) Instruction for traffic signs

Figure 4.2: List of activities

As soon as children enter the activities section, an instruction box will appear to explain the page material and its purpose.

4.3 Traffic Signs

After Navigating to the Traffic Lights lesson, children will then see this page containing a picture of traffic lights with a heading asking "what do traffic lights mean" along with an answer at the bottom explaining that it is a control system for vehicles on the roads. A navigation bar with next and back arrows is available at the top of the page so that users can easily move to either the next or back page. Children can also swipe the page to access a further lesson regarding traffic lights. Moreover, the voice feature in this mobile application is more supportive as it explains each scenario and image included in the application and guides the users to the further step or page.
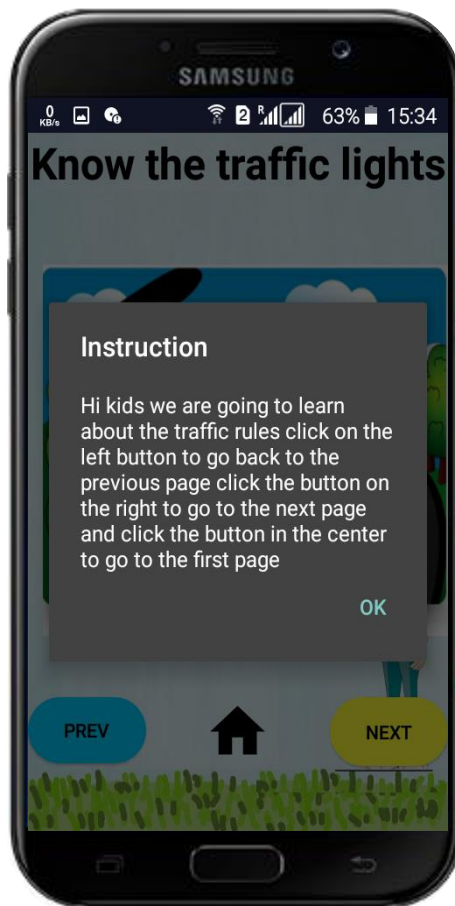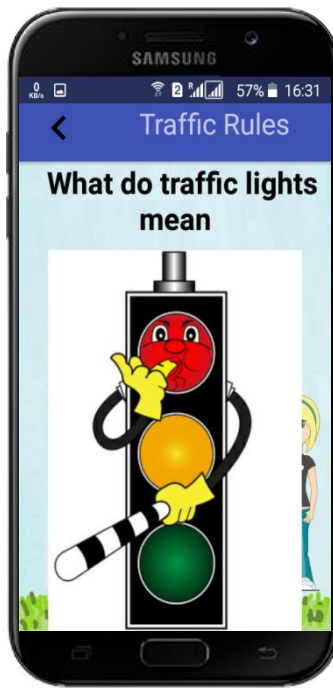

(a) Snapshot from instruction
(Image source: https://www.shutterstock.com/image-vector/shining-traffic-light-car-forest-road-103291886?irgwc=1&utm_medium=Affiliate&utm_campaign=Hans%20Braxmeier%20und%20Simon%20Steinberger%20GbR&utm_source=44814&utm_term=)
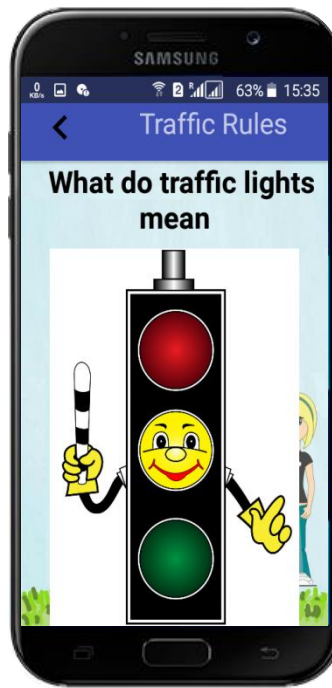
(b) Snapshot from traffic rules
(Image source: http://clipartsign.com/image/27084/)

Figure 4.3: Traffic signs along with instruction

(a) Red light	(b) Yellow light	(c) Green light
(Image source: http://www.canstockphoto.co m/cartoon-red-traffic-light-17586387.html)	(**Image source:** http://www.canstockphoto.co m/cartoon-yellow-traffic-light-16727227.html)	**(Image source:** http://www.canstockphoto.c om/cartoon-green-traffic-light-17612602.html)

Figure 4.4: Traffic signs

Figure 4.3 and Figure 4.4 respectively shows the traffic lights along with relevant explanations and instructions. Furthermore, Figure 4.4 further shows the meaning of the yellow light in the traffic light system.

4.4 Traffic Symbols

The next lesson is regarding traffic symbols, which is also one of the important aspects of road safety that should be learned by children. Children can navigate to this section from the activities page. Here, they can see numerous traffic symbols along with their meaning and purpose mentioned on each page along with audio. Children can swipe at any time for the next symbol sign or easily switch back to the activity page. The sound feature in the application will further guide the users in this page about each instruction. Figure 4.5 below shows the traffic symbols and an explanation of their purpose.

(**Image source:** https://tr.pinterest.com/pin/217932069446582721/)

Figure 4.5: Traffic symbols (main screen)

(a) Pin Bend
(**Image source:**
https://es.123rf.com/photo_51375917
_se-al-de-tr-fico-izquierda-u-turn-
signo-en-fondo-
blanco.html?fromid=emRVYWZKbE
lZNkp1bjJKdDd4eEFtZz09)

(b) Falling rocks
Image source:
https://pixabay.com/en/rockslide-
sign-warning-sign-26517/)

(c) Zebra Crossing
(**Image source:**
https://www.shutterstock.com/ko/image
-vector/illustration-young-lady-
crossing-pedestrian-lane-129784712)

(d) Train Crossing
(**Image source:**
https://pixabay.com/en/warning-
danger-railway-crossing-910145/)

(e) Loose gravel
Image source:
https://pixabay.com/en/drive-car-road-information-warning-44267/)

(f) Y- lane
(**Image source:**
https://www.shutterstock.com/ko/image-vector/us-y-intersection-sign-663875677)

Figure 4.6: Traffic symbols – some of them

4.5 Traffic Scenario

The traffic scenario activity presents an entire traffic situation, Figure 4.6 and Figure 4.7 clearly illustrate what a traffic scenario exactly means. It explains what could occur on the roads if rules are not followed carefully. Furthermore, the sound in the application will explain the meaning of the image and will guide you to the next page.
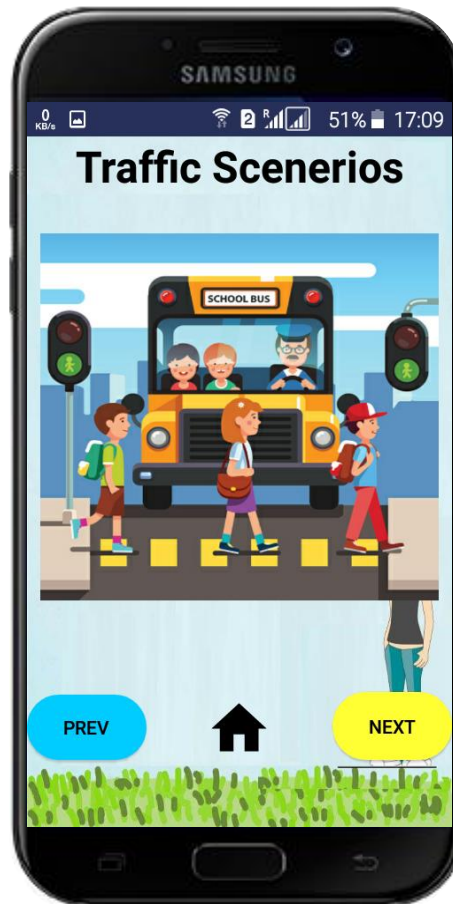
(**Image source:**
https://www.shutterstock.com/image-
vector/kids-boys-girls-school-pupils-
crossing-505431928?src=JizTszRmhT-
Bg_RzovaSzQ-1-4)

Figure 4.7: Traffic scenario (main screen)
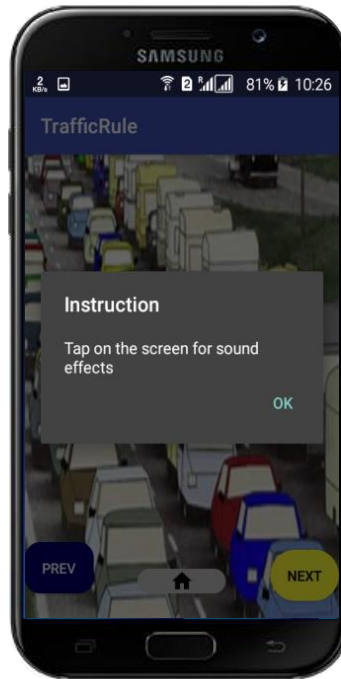
(a)Instruction traffic scenario
(**Image source:**
http://clipground.com/image-
post/66842-traffic-report-clipart-
3.jpg.html)

(b) Traffic jam
(**Image source:**
http://clipground.com/image-
post/66842-traffic-report-clipart-
3.jpg.html)

(c) Policeman controlling traffic
(**Image source:**
https://www.shutterstock.com/ima
ge-vector/city-intersection-
policeman-controls-traffic-
103677926)

(d) When we don't use traffic rules
(**Image source:**
https://www.shutterstock.com/th/image-vector/infographic-accidents-injuries-danger-safety-on-357477158

(e) Road markings
(**Image source:**
http://www.carcanyon.com/nhtsa-rsquo-s-summer-driving-tips-an-interactive-road-map-to-safety_xEwmyS38rYLmIn9B6nzARaaNb96*vH
tgeWSIIrrNnwFAzc6f*bLi*D*MB7RJ0rfE%7C
rkQh1N9BQ9C%7CuQTGTdn3l1z7gFokJ1*BG
VnLospX2vHG2gt8z0166krFrbosfCF/Z3XPoD
UqCdT6iZ7ih6COyZ%7CY6SAZzh5olNkff0FB
KDgWF2xv4KkEqu6LmX*pEigEt5NTj443J7C
10CSdNuSKFS2Lft6SnRGCPXccD2LO%7C4F
YX4lJuJn39w7U7Wsp6IY7/#)

Figure 4.8: Instruction and traffic scenario

4.6 Quiz Section

The quiz section is a particularly important element of this application, as it motivates children to learn the traffic rules carefully. By doing so they can then attempt to complete the quiz to ensure the knowledge about traffic rules has been understood. The quiz section contains 25 multiple questions related to traffic rules mentioned in this application; in this quiz section name and age are saved in order to keep record of the highest scores which gives information about how the Children is familiar with the traffic rules. children's can enter their name and age to attempt the quiz, after saving the information a quiz containing random question either related to traffic lights, sign etc. will appear.

Children's will be allowed to choose one answer; in case of right answer a point will be added to the children's score section. An example of this quiz can be seen in Figure 4.8 below:

    (a) Registration   (b) Example from question

(**Image source:**
https://giphy.com/gifs/l0HlKQPTHOGNUPTZ
m

Figure 4.9: Quiz section

Figure 4.10: Result of the Quiz

Children can enter their name and age to attempt the quiz; after saving the information, a quiz containing random questions related to either traffic light, signs etc. will then appear. The children will be allowed to select one answer; if they choose the correct answer, a point will be added to the child's score section. The questions appear one by one and, at the end, the user will be advised of their total score. If they achieve a high score, a congratulatory greeting will be displayed on the screen along with the total score and a trophy image, as depicted in Figure 4.10 above. If they choose to do so, the children can attempt the quiz section again, or press the exit button to return to the other lessons.

4.7 Safety Tips

This section aims to provide children with additional but important safety tips, and it contains graphical representation of safety guidance. Figure 4.9 shows some of the tips that will enable children to be safe on the road:

(**Image source:**
https://www.police.gov.sg/resources/preve
nt-crime/crime-prevention-posters/road-
safety-poster)
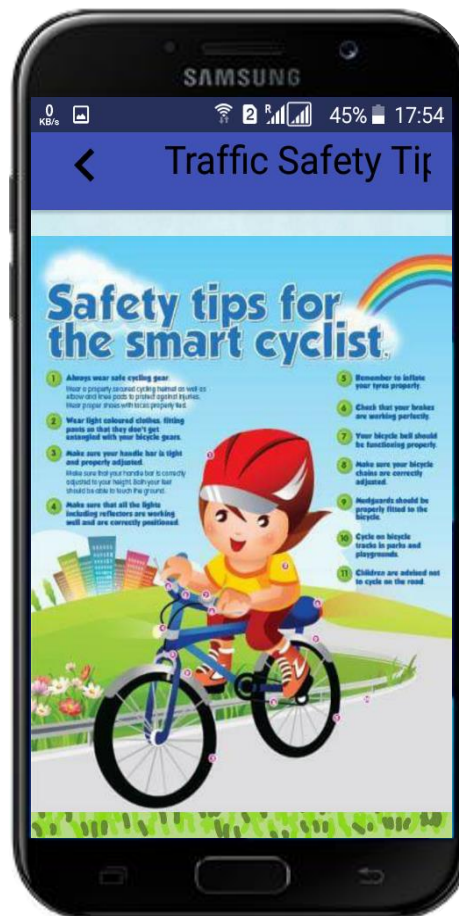
Figure 4.11: Safety tips (main screen)
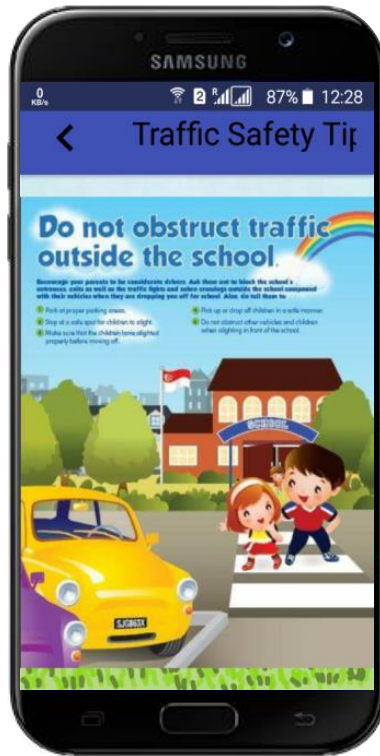
(a) Cross the road
(**Image source:**
https://www.google.com.cy/imgres?imgurl=htt
ps://tse3.mm.bing.net/th%3Fid%3DOIP.khrhV
8GosoxdDkEASNWCSQDWEs%26pid%3DA
pi%26w%3D128%26h%3D181&imgrefurl=htt
ps://jikoman.info/main/road-safety-for-
children-
posters.ben&h=181&w=128&tbnid=zVpZ2zP
uquAMjM&tbnh=181&tbnw=128&usg=__7T
Nkj_qTAz1duol6am3xRyMpGck=&hl=ar-
CY&docid=9jjHUHJBhUDHaM.jpg

(b) Rules for crossing safety
(**Image source:**
http://sengkangbabies.com/wp-
content/uploads/2013/11/How-to-
cross-the-road.jpg)

(c) Attention when you cross
(**Image source:**
http://bigpictures.club/resize.php?
img=http://srsc.org.sg/wp-
content/themes/srsc/images/poste
rs/4.jpg)

(d) Green – cross the road
(**Image source:**
https://twitter.com/shofalaknuma/status/
856844380711391232)

Figure 4.12: Safety tips - example

CHAPTER 5

CONCLUSION

Children's education is a particularly critical challenge for adults. This is attributed to the fact that a child's mind is receptive. Therefore, successful pre-school education can enhance a child's development. Various learning domains influence children's development and the acquisition of knowledge. In line with this, all learning domains should be considered. Unfortunately, many modern parents fail to assign sufficient time to address the learning needs of their children. In the case of traffic rules, it is usually expected that when children learn about road safety, they should know about the safety signs. Furthermore, it is important to understand their individual behaviour and decision-making capabilities to choose appropriate places to cross the road. As soon as children gain more knowledge and experience different traffic scenarios, they become more adept at differentiating the traffic situations, such as where to stop and when to cross. Therefore, it is strongly recommended that children should be guided in learning about traffic rules and they should be made aware of traffic dangers. To do so, training or guide books can be useful. Thus, the use of mobile devices has facilitated this process; children prefer to use applications rather than reading books. Thus, teaching children traffic rules via an application is important to save lives.

According to previous studies, a highly interactive product is ideal as it facilitates the development of appropriate cognitive skills in children. It creates a fascinating learning environment that elevates the children's engagement levels. Hence, it offers a state-of-the-art solution to support the learning needs of pre-school children. Ideally, devices such as smartphones and tablets can address the learning needs of children quite effectively (Chen, 2010). Hence, creating an application that helps children in learning is important in the education system. There are numerous applications available for children to learn in different aspects; however, there are a limited number of studies that have specifically focused on traffic rules. According to a search of the market, only a few applications based on traffic rules lessons are available and they are deficient in many aspects.

This research study has paid significant attention to technology and how it improves children's learning experiences. It has also provided solutions on how user interface

design principles can be used in a more effective way to enhance learning. The developed mobile application covers all requisite gaps and creates a more interactive and easy application for children. The developed mobile application provides a complete guidance for children of all age levels and the quiz section in particular is effective at catching children's attention and increasing their motivation towards learning traffic rules.

Based on the present study we hope that the developed mobile application is useful for helping children to learn traffic rules, which can prevent loss of life in traffic accidents. The application is distinct in many ways from the existing applications, such as its attractive design, colourful graphics, audio and text based instructions, easy navigation, and perfectly organized content along with a quiz section.

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APPENDICES

ACTIVITIES PAGE

```java
package com.falcon.pri_pri.trafficrule;

/**

 * Created by pri-pri on 4/26/2017. */

import android.app.Activity;

import android.app.AlertDialog;

import android.content.Context;

import android.content.DialogInterface;

import android.content.Intent;

import android.os.Bundle;

import android.view.View;

import android.widget.AdapterView;

import android.widget.ArrayAdapter;

import android.widget.Button;

import android.widget.ListView;

import android.widget.Toast;


/**

 * Created by pri-pri on 5/12/2017. */

public class Act extends Activity {

    ListView lv;

    ListView listItemView;

    Button btn4;

    ListView simpleList;

    ///the items to be displayed on the list
```

```java
String countryList[] = {"Traffic Signs", "Traffic Symbols", "Traffic Scenario",
"Traffic Quiz", "Safety Tips"};

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.list);

        //Calls the alert dialog to give the instruction

        showSimplePopUp();

        //displays the list

        listItemView = (ListView) findViewById(R.id.listup);

        //add the items to the list with the help of the baseadapter

        listbase customAdapter = new listbase(getApplicationContext(), countryList);

        listItemView.setAdapter(customAdapter);

        // ListView setOnItemClickListener function apply here.

        listItemView.setOnItemClickListener(new AdapterView.OnItemClickListener()
{

            @Override

            public void onItemClick(AdapterView<?> parent, View view,

                        int position, long id) {

                // to change between activity

                switch (position) {


 case 0:

                Intent myIntent = new Intent(view.getContext(), image1.class);

                startActivityForResult(myIntent, 0);

                break;
```

```java
case 1:

            Intent myIntent1 = new Intent(view.getContext(), gridact1.class);

            startActivityForResult(myIntent1, 0);

            break;

case 2:

            Intent myIntent2 = new Intent(view.getContext(), scene11.class);

            startActivityForResult(myIntent2, 0);

            break;

case 3:

            Intent myIntent3 = new Intent(view.getContext(), quizlog.class);

            startActivityForResult(myIntent3, 0);

            break;

 case 4:

             Intent myIntent4 = new Intent(view.getContext(), game1.class);

             startActivityForResult(myIntent4, 0);

             break;

        }

      }

   });


  btn4=(Button)findViewById(R.id.button26);

  btn4.setOnClickListener(new View.OnClickListener() {

   @Override

   public void onClick(View v) {

     Intent intent = new Intent(Act.this,Vidpage.class);

     startActivity(intent);

     // finish();
```

```java
        }

    });

}

//the alert dialog

private void showSimplePopUp() {

    AlertDialog.Builder helpBuilder = new AlertDialog.Builder(this);

    helpBuilder.setTitle("Instruction");

    helpBuilder.setMessage("Hi! Childrens welcome to traffic rules on this page
you will see" +

        " five button click, on any of them to go to the next page");

    helpBuilder.setPositiveButton("Ok",

        new DialogInterface.OnClickListener() {

            public void onClick(DialogInterface dialog, int which) {

                // Do nothing but close the dialog

            }

        });

    // Remember, create doesn't show the dialog

    AlertDialog helpDialog = helpBuilder.create();

    helpDialog.show();

}

//to remove unclose activity

@Override

public void onBackPressed() {

    moveTaskToBack(true);

    finish();

}

}
```

APPENDIX 2

TRAFFIC SIGNS

```
package com.falcon.pri_pri.trafficrule;

import android.app.Activity;

import android.content.Intent;

import android.media.MediaPlayer;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.ImageButton;

import android.widget.ImageView;

import android.widget.TextView;

import de.hdodenhof.circleimageview.CircleImageView;


/**
 * Created by pri-pri on 4/11/2017.
 */
public class single extends Activity {

    ImageButton btn;

    Button btn2,btn1;
```

```java
MediaPlayer medi;

@Override

protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.lay);

    medi = MediaPlayer.create(single.this, R.raw.scene3);

    medi.start();

    btn = (ImageButton) findViewById(R.id.imageButto1);

    btn.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {

            Intent intent = new Intent(single.this, scene1.class);

            startActivity(intent);

            finish();

        }

    });


    btn2 = (Button) findViewById(R.id.butt5);

    btn2.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {
```

```java
        Intent intent = new Intent(single.this, scen2.class);

        startActivity(intent);

        finish();

      }

   });

  }

  @Override

  public void onBackPressed() {

    Intent intent = new Intent(single.this,scene11.class);

    startActivity(intent);

    medi.stop();

    finish();

    super.onBackPressed();

  }

  @Override

  public void onDestroy() {

    medi.stop();

    finish();

    super.onDestroy();

  }

}
```

APPENDIX 3

TRAFFIC SYMBOLS

```
package com.falcon.pri_pri.trafficrule;

import android.content.Context;

import android.content.res.AssetManager;

import android.graphics.Typeface;

import android.media.MediaPlayer;

import android.support.v4.view.PagerAdapter;

import android.view.LayoutInflater;

import android.view.View;

import android.view.ViewGroup;

import android.view.animation.AnimationUtils;

import android.widget.BaseAdapter;

import android.widget.Button;

import android.widget.ImageView;

import android.widget.TextView;

import android.widget.Toast;


/**

 * Created by pri-pri on 4/10/2017.
```

```java
 */


public class base extends PagerAdapter{

    //the adapter for the swiping of images

    Toast  toast;

    //the declaration for the images and text

    private    int[]    img={R.drawable.reddd,R.drawable.sym11,R.drawable.sym21,
        R.drawable.images,

                R.drawable.sym1,R.drawable.tr,R.drawable.sym8,R.drawable.sym9,

                R.drawable.sym15,R.drawable.sym16,R.drawable.sym22,

                R.drawable.sym18,R.drawable.stt, R.drawable.s1,R.drawable.s2,

                R.drawable.s3,R.drawable.s4,R.drawable.s5,R.drawable.s6,


                R.drawable.s11,R.drawable.s12,R.drawable.s13,R.drawable.s15,

                R.drawable.p1,R.drawable.p2,R.drawable.p6,R.drawable.p9};

    private String[]txt={"Traffic Light","Pin Bend","Falling Rocks","Zebra crossing",

                "Reverse Bend","Train Crossing","Loose Gravel","Y-lane",

                "Narrow Road","Wide Road", "Bumps",

                "School Ahead","Stop Sign","One way","Closed Road",

                "Pedestrian  Not  Allowed","Overtaking  Not  Allowed","Straight
    Prohibited","No Left Turn",

                "Compulsory Turn Left","Compulsory RightTurn","GiveWay",
```

"Speed Limit","Stop Vehicles from behind","Start Vehicles On One Sides","Stop Vehicles From Behind and front",

"Stop Vehicles in Front"};

```java
    private Context con;

    TextView view;

    private LayoutInflater inflater;


    public base(Context con) {

        this.con = con;

    }

    @Override

    public int getCount() {

        return img.length;

    }


//this here is to make the images and the text display the data

    @Override

    public Object instantiateItem(ViewGroup container, final int position) {


        inflater=(LayoutInflater)con.getSystemService(Context.LAYOUT_INFLATER_SERVICE);

        final View view1=inflater.inflate(R.layout.trafficgrid,container,false);

        ImageView button=(ImageView) view1.findViewById(R.id.imagButton2);
```

```java
        button.setImageResource(img[position]);

        TextView textView=(TextView)view1.findViewById(R.id.textView90);

        textView.setText(txt[position]);


        container.addView(view1);

        return view1;

    }

    @Override

    public void destroyItem(ViewGroup container, int position, Object object) {

    }

    @Override

    public boolean isViewFromObject(View view, Object object) {

        return (view==object);

    }


}
```

```java
package com.falcon.pri_pri.trafficrule;

import android.app.Activity;

import android.content.Intent;

import android.media.MediaPlayer;

import android.os.Bundle;

import android.support.v7.app.ActionBar;

import android.support.v7.app.AppCompatActivity;

import android.view.View;

import android.widget.Button;

import android.widget.ImageButton;

import android.widget.TextView;

import de.hdodenhof.circleimageview.CircleImageView;


/**

 * Created by pri-pri on 4/8/2017.

 */


public class scen extends Activity {
```

```java
TextView txt,textView,ttx,tx1;

CircleImageView btn, btn1, btn2, btn3;

ImageButton    btb;Button    bt,bt1;    MediaPlayer    mediaPlayer11;MediaPlayer
    mediaPlayer12,mediaPlayer13,

    mediaPlayer5,mediaPlayer6,mediaPlayer7,mediaPlayer8,medi;

@Override

protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.scce);


    medi = MediaPlayer.create(scen.this, R.raw.scence2);

    medi.start();

    mediaPlayer11 = MediaPlayer.create(this, R.raw.to);

    txt = (TextView) findViewById(R.id.textView7);

    txt.setOnClickListener(new View.OnClickListener() {


        @Override

        public void onClick(View v) {

            mediaPlayer11.start();

        }

    });

    mediaPlayer12 = MediaPlayer.create(this, R.raw.pop);
```

```java
tx1= (TextView) findViewById(R.id.textView8);

tx1.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

        mediaPlayer12.start();

    }

});

mediaPlayer13 = MediaPlayer.create(this, R.raw.air);

ttx = (TextView) findViewById(R.id.textView13);

ttx.setOnClickListener(new View.OnClickListener() {


    @Override

    public void onClick(View v) {

        mediaPlayer13.start();

    }

});

mediaPlayer5 = MediaPlayer.create(this, R.raw.bus);

textView = (TextView) findViewById(R.id.textView14);

textView.setOnClickListener(new View.OnClickListener() {


    @Override
```

```java
    public void onClick(View v) {

        mediaPlayer5.start();

    }

});

mediaPlayer6 = MediaPlayer.create(this, R.raw.bell);

textView = (TextView) findViewById(R.id.textView15);

textView.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

        mediaPlayer6.start();

    }

});

mediaPlayer7 = MediaPlayer.create(this, R.raw.wh);

textView = (TextView) findViewById(R.id.textView16);

textView.setOnClickListener(new View.OnClickListener() {


    @Override

    public void onClick(View v) {

        mediaPlayer7.start();

    }

});
```

```java
mediaPlayer8 = MediaPlayer.create(this, R.raw.babby);

textView = (TextView) findViewById(R.id.textView17);

textView.setOnClickListener(new View.OnClickListener() {


    @Override

    public void onClick(View v) {

        mediaPlayer8.start();

    }

});

btb = (ImageButton) findViewById(R.id.imageButt14);

btb.setOnClickListener(new View.OnClickListener() {


    @Override

    public void onClick(View v) {

        Intent intent = new Intent(scen.this,scene1.class);

        startActivity(intent);

        finish();

    }

});

bt = (Button) findViewById(R.id.buttn2);

bt.setOnClickListener(new View.OnClickListener() {
```

```java
        @Override

        public void onClick(View v) {

            Intent intent = new Intent(scen.this,scene1.class);

            startActivity(intent);

            finish();

        }

    });

    bt1 = (Button) findViewById(R.id.butt);

    bt1.setOnClickListener(new View.OnClickListener() {


        @Override

        public void onClick(View v) {

            Intent intent = new Intent(scen.this,scen2.class);

            startActivity(intent);

            finish();

        }

    });

}

@Override

protected void onDestroy() {
```

```java
        finish();

        mediaPlayer11.stop();

        mediaPlayer12.stop();

        mediaPlayer13.stop();

        mediaPlayer5.stop();

        mediaPlayer6.stop();

        mediaPlayer7.stop();

        mediaPlayer8.stop();

        medi.stop();

        super.onDestroy();

    }

    @Override

    public void onBackPressed() {

        Intent intent = new Intent(scen.this,scene11.class);

        startActivity(intent);

        super.onBackPressed();


    }

}
```

```java
package com.falcon.pri_pri.trafficrule;

import android.app.Activity;

import android.app.AlertDialog;

import android.content.DialogInterface;

import android.content.Intent;

import android.graphics.Typeface;

import android.os.Bundle;

import android.support.v7.app.AppCompatActivity;

import android.view.View;

import android.view.animation.Animation;

import android.view.animation.AnimationUtils;

import android.widget.Button;

import android.widget.ImageView;

import android.widget.TextView;

import java.io.FileInputStream;

import java.util.Random;

import static android.view.View.VISIBLE;
```

```java
/**

 * Created by pri-pri on 4/12/2017.

 */

public class quiz extends AppCompatActivity {

    Button ans, ans1, ans2, ans3, ans4,btn1;

    String text, text1;

    TextView scre, ques, textview, mTextview;

    ImageView img;

    private quizad qui = new quizad();

    private String anss;

    private int mscre = 0;

    private int quilen = qui.mques.length;

    Random r;int x;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.quizz);

        final Animation animation = AnimationUtils.loadAnimation(this, R.anim.scale);

        ans = (Button) findViewById(R.id.ans);

        ans1 = (Button) findViewById(R.id.ans2);

        ans2 = (Button) findViewById(R.id.ans3);
```

```java
ans3 = (Button) findViewById(R.id.ans4);

// textview = (TextView) findViewById(R.id.textView36);

ques = (TextView) findViewById(R.id.textView31);

img = (ImageView) findViewById(R.id.imageView);

scre = (TextView) findViewById(R.id.textView30);

r = new Random();


scre.setText("score:" + mscre);

upd(r.nextInt(quilen));


ans.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

        // v.startAnimation(animation);

        if (ans.getText() == anss) {

            mscre++;

            scre.setText("score:" + mscre);

            upd(r.nextInt(quilen));

        } else {

            gover(mscre);

        }
```

```java
        }

    });


    ans1.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {

            v.startAnimation(animation);

            if (ans1.getText() == anss) {


                mscre++;

                scre.setText("score:" + mscre);

                upd(r.nextInt(quilen));


            } else {

                gover(mscre);


            }

            // v.startAnimation(animation);

        }

    });

    ans2.setOnClickListener(new View.OnClickListener() {
```

```java
        @Override

    public void onClick(View v) {

      // v.startAnimation(animation);

      if (ans2.getText() == anss) {

        mscre++;

        scre.setText("score:" + mscre);


        upd(r.nextInt(quilen));

      } else {

        gover(mscre);

      }

      // v.startAnimation(animation);

    }

});

ans3.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View v) {

      // v.startAnimation(animation);


      if (ans3.getText() == anss) {

        mscre++;
```

```java
                scre.setText("score:" + mscre);


                upd(r.nextInt(quilen));

            } else {

                gover(mscre);

            }


        }

    });

}

private void upd(int num) {

    ques.setText(qui.getQues(num));

    ans.setText(qui.getChoice1(num));

    ans1.setText(qui.getChoice2(num));

    ans2.setText(qui.getChoice3(num));

    ans3.setText(qui.getChoice4(num));

    img.setImageResource(qui.getImg(num));

    anss = qui.getAns(num);

}

private void gover(int mm) {

    if(mm<=10) {
```

```java
            text = scre.getText().toString();

            Intent myIntent = new Intent(quiz.this, ScrollingActivity.class);

            myIntent.putExtra("one", text);

            startActivity(myIntent);

        }else{

            text1 = scre.getText().toString();

            Intent myIntent1 = new Intent(quiz.this, aim.class);

            myIntent1.putExtra("two", text1);

            startActivity(myIntent1);

        }

    }

    @Override

    public void onBackPressed() {

        moveTaskToBack(true);

        finish();

    }

}
```

```
package com.falcon.pri_pri.trafficrule;

import android.app.Activity;

import android.app.AlertDialog;

import android.content.DialogInterface;

import android.content.Intent;

import android.graphics.PixelFormat;

import android.graphics.Typeface;

import android.media.MediaPlayer;

import android.net.Uri;

import android.os.Bundle;

import android.view.View;

import android.view.Window;

import android.view.animation.Animation;

import android.view.animation.AnimationUtils;

import android.widget.Button;

import android.widget.LinearLayout;

import android.widget.RelativeLayout;

import android.widget.TextView;
```

```java
/**

 * Created by pri-pri on 4/6/2017.

 */

public class SlapshScreen extends Activity {

  /**

    * ATTENTION: This was auto-generated to implement the App Indexing API.

    * See https://g.co/AppIndexing/AndroidStudio for more information.

    */

  MediaPlayer medi;

  TextView view;

  public void onAttachToWindow() {

    super.onAttachedToWindow();

    Window wnd = getWindow();

    wnd.setFormat(PixelFormat.RGBA_8888);

  }


  Thread splashthread;


  @Override

  protected void onCreate(Bundle savedInstanceState) {
```

```java
        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_splashscreen);

        medi = MediaPlayer.create(SlapshScreen.this, R.raw.traff);

        medi.start();


        Button textView=(Button)findViewById(R.id.button7);

        textView.setOnClickListener(new View.OnClickListener() {


            @Override

            public void onClick(View v) {

                Intent i=new Intent(SlapshScreen.this,Act.class);

                startActivity(i);

                finish();

            }

        });

        // ATTENTION: This was auto-generated to implement the App Indexing API.

        // See https://g.co/AppIndexing/AndroidStudio for more information.

        startani();

    }


    private void startani() {
```

```java
final Animation anim = AnimationUtils.loadAnimation(this, R.anim.alpha);

anim.reset();

RelativeLayout li = (RelativeLayout) findViewById(R.id.activity_main);

li.clearAnimation();

li.startAnimation(anim);

splashthread = new Thread() {

  @Override

  public void run() {

    try {

      int waited = 0;

      // Splash screen pause time

      while (waited < 3700) {

          sleep(400);

           waited += 100;

      }

      TextView textView=(TextView)findViewById(R.id.button7);

      textView.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View v) {

          Intent i=new Intent(SlapshScreen.this,Act.class);

          startActivity(i);
```

```java
                finish();

            }

        });


    } catch (InterruptedException e) {

        finish();

        // do nothing

    }

};

splashthread.start();

}

@Override

protected void onDestroy() {

    medi.stop();

    super.onDestroy();

}

public void stp (){

    finish();

}

}
```

APPENDIX 7

LINKS OF ALL IMAGES

- https://pixabay.com/en/bicycles-restriction-prohibition-910029/

- https://pixabay.com/en/no-parking-sign-signage-road-sign-910010/

- https://pixabay.com/en/road-sign-direction-arrow-traffic-910025/

- https://pixabay.com/en/sign-road-sign-roadsign-160741/

- https://pixabay.com/en/no-left-turn-traffic-sign-sign-160689/

- https://en.wikipedia.org/wiki/All-way_stop#/media/File:MUTCD_R1-1.svg

- https://pixabay.com/en/road-narrows-on-both-sides-160655/

- https://pixabay.com/en/roundabout-traffic-sign-sign-160679/

- https://pixabay.com/en/warning-danger-railway-crossing-910145/

- https://pixabay.com/en/drive-car-road-information-warning-44267/

- https://es.123rf.com/stock-photo/uturn.html?mediapopup=40461450

- https://pixabay.com/en/attention-street-sign-road-sign-1029188/

- https://pixabay.com/en/narrow-bridge-bridge-narrow-warning-32604/

- https://commons.wikimedia.org/wiki/File:Road_Sign_No_Overtaking.jpg#/media/File:Road_Sign_No_Overtaking.jpg

- https://commons.wikimedia.org/wiki/File:Road_sign_school_india.png

- https://www.shutterstock.com/ko/image-vector/us-y-intersection-sign-663875677

- https://wpclipart.com/travel/US_Road_Signs/warning/warn_1/road_narrows_ahead.png.html

- https://pixabay.com/en/sign-either-road-transport-24344/

- https://www.shutterstock.com/image-vector/vector-traffic-officer-36250594?src=m-kfggcsng7L8uM07UqTtg-1-0

- http://www.canstockphoto.com/cartoon-red-traffic-light-17586387.html

- http://www.canstockphoto.com/cartoon-yellow-traffic-light-16727227.html

- http://www.canstockphoto.com/cartoon-green-traffic-light-17612602.html

- https://www.shutterstock.com/image-vector/shining-traffic-light-car-forest-road-103291886?irgwc=1&utm_medium=Affiliate&utm_campaign=Hans%20Braxmeier%20und%20Simon%20Steinberger%20GbR&utm_source=44814&utm_term=

- https://www.shutterstock.com/th/image-vector/infographic-accidents-injuries-danger-safety-on-357477158

- https://es.123rf.com/photo_24467755_3d-de-bajo-barrera-de-la-construcci-n-con-los-conos-de-tr-fico-aislado-en-el-fondo-blanco.html?fromid=MlBmNlRFMkR2SzVxRjdRMWROV2d0QT09

- https://pixabay.com/en/hump-speed-breaker-bump-warning-32605/

- https://pixabay.com/en/warning-design-idea-1451887/

- https://ambergriscaye.com/forum/ubbthreads.php/ubb/printthread/Board/1/main/51291/type/thread.html

- https://www.shutterstock.com/image-vector/city-intersection-policeman-controls-traffic-103677926

- https://pixabay.com/en/traffic-sign-road-sign-shield-6628/

- https://www.shutterstock.com/image-photo/uturn-road-sign-isolated-on-white-128189156

- http://resizeandsave.online/openphoto.php?img=http://m.cexams.net/rs/Road_Signs/One_Way2.jpg

- https://www.shutterstock.com/image-illustration/yellow-traffic-square-shaped-right-double-285982400

- http://www.i2clipart.com/clipart-indian-road-sign-no-entry-7e2f

- https://www.shutterstock.com/image-photo/roundabout-traffic-sign-against-blue-sky-141454375?src=OOvFa4mHUmxzPQULv327oA-2-74
- https://www.shutterstock.com/image-illustration/no-trespassing-sign-isolated-over-white-56770753

- https://www.shutterstock.com/image-vector/kids-boys-girls-school-pupils-crossing-505431928?src=JizTszRmhT-Bg_RzovaSzQ-1-4

- http://clipground.com/image-post/66842-traffic-report-clipart-3.jpg.html

- https://pixabay.com/en/rockslide-sign-warning-sign-26517/

- http://www.alamy.com/stock-photo-school-ahead-signboard-37783639.html

- https://www.shutterstock.com/ko/image-vector/illustration-young-lady-crossing-pedestrian-lane-129784712

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