Scientific and Social Research, 2025, Volume 7, Issue 5
https://ojs.bbwpublisher.com/index.php/SSR
Online ISSN: 2981-9946
Print ISSN: 2661-4332

# Investigating the Knowledge and Behavior of Road Users in Adherence to Traffic Ethics

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**Abstract:** This study aims to investigate road users' knowledge and behavior towards traffic ethics among university students in Qingjiangpu District, Huai'an, Jiangsu Province, China. The study helps to identify whether the concept of traffic ethics is effectively understood and applied by road users, focusing on students within the area. It also aims to identify the most commonly used mode of transportation among students in the city and assess their level of understanding of traffic ethics and the importance of adhering to them for road safety in the city. From the pilot questionnaire issued to 50 random students across the universities in this district, it can be concluded that most of the students who use a two-wheel vehicle (bicycle, electric bike, or motorcycle) have a mode of transportation, and this helps to sharpen the questionnaire and direction of this research. All the participants in this study are Chinese and international students within the age of 16 years and above (undergraduate and postgraduate), with 67 percent of respondents male and 33 percent female; 76 percent are domestic students while 23 percent are international students. An online questionnaire survey was created and conducted for effectiveness in reaching out to students in other institutions through QR codes to assess the questionnaire. A random sampling method is employed, and a definite sample size formula is used to determine the sample size of participants for the study. With over 22,000 students in the research site, through the use of a sample size of the known population, 380 participants were administered questionnaires, which included socio-demographic information and various questions about the knowledge of traffic ethics and behavior on the road. According to the findings, it can be seen that mobile phone addiction plays a big role in traffic safety amongst students and also the need for proper orientation about traffic ethics most especially at the point of road intersection, within and outside the institutional framework as areas where there is an institution or university is usually populated due to high number of students, staffs, university workers and other road users in the vicinity. The data from the questionnaire are analyzed using SPSS in descriptive statistics. The majority of participants are aware of traffic ethics, but become complacent due to the less frequent occurrence of major accidents on the road caused by negligence.

**Keywords:** Traffic; Ethics; Pedestrian; Intersection; University students; Traffic ethics; Motorcycle; E-bike; Bike lane

**Online publication:** June 6, 2025

# 1. Introduction

According to the crash analysis report from 2016, the World Health Organization (WHO) published that in its 2018 global status report on road safety, there are over 1.35 million deaths as a result of road traffic crashes and violations, and it is ranked the eighth leading cause of death worldwide [1–2].

Road accidents in China remain a huge worry, irrespective of the fast-growing pace in infrastructure and growth rate in the last couple of years, with traffic ethics playing an essential part in this situation. Regardless of endeavors to further develop road safety, the absence of adherence to ethical standards and traffic guidelines continues to add to the high frequency of accidents. This issue explanation expects to feature the relentless issue of road accidents in China because of a lack of traffic ethics, upheld by pertinent regulations.

As per the World Health Organization (WHO), China has one of the highest rates of road traffic fatalities internationally. In 2019, China revealed that there were 58,000 road traffic deaths, representing around 16% of worldwide road traffic fatalities. Fast urbanization and financial improvement have prompted a critical expansion in road traffic volume in China. With additional vehicles on the road, the risk of accidents rises, especially in thickly populated metropolitan regions and along significant transportation corridors. It forces critical monetary costs on China's general public and economy. As indicated by the World Bank, road traffic injuries and fatalities cost China an expected 1.2% of its Gross domestic product every year. These expenses incorporate clinical costs, property damage, lost efficiency, and the effect on the transportation and protection enterprises.

Weak road users, like pedestrians, cyclists, and motorcyclists, bear an unbalanced weight of road traffic wounds and fatalities in China. As per the WHO, pedestrians and cyclists represented almost 50% of all road traffic mortality in China in 2019. Large numbers of these fatalities are the aftereffect of impacts with engine vehicles, highlighting the need to focus on the safety of vulnerable road users.

Furthermore, as people become more obsessed and addicted to their mobile phone, likewise with almost all necessities of life all embedded in it, this has also become a big factor towards road safety, as most road users get easily distracted by it and find it difficult to take their eyes off their mobile device. It can be popularly seen in most cases as people walk on the road, head buried in their mobile device with less attention to road activities, which can be dangerous most especially at intersection points. It is not only common among pedestrians, but likewise drivers and cyclists, as the urge to ride and have access to their device at the same time can prove costly.

These keep on representing a significant danger to public wellbeing, with a lack of traffic ethics filling in as a huge contributing factor. Resolving this issue requires a thorough methodology that tends to the foundation and implementation as well as open mindfulness and instruction on the significance of ethical behavior on the road. By handling these difficulties, it can bring about progress toward decreasing the rate of road accidents and making transportation frameworks more secure for all road users.

As a result of the growing cases of road accidents amongst youths due to lack of adherence to traffic ethics and safety, this study is aimed at understanding the level at which students are ethically inclined with traffic ethics, rules and regulations, taking into consideration their behavior on the road.

Students are persons who are learning at every secondary, tertiary and institutional level, whether private and public that is at the university level. Students are believed to be intellectual, creative and intelligent in thinking and in action. Ability to think creatively and act accordingly are noted as some of the attributes of students [3].

They are also believed to be one of the most intellectual members of society, and the environment they reside in, and are expected to comport themselves professionally and appropriately in both society and the academic environment. Students' roles are not only confined to the classroom of learning but also beyond. Students have their place in society, which does not exclude them from society, which means there are expectations for students in society. It is important to develop roles, duties, and expectations of students to determine the area of struggle of these students [4].

It is popularly known that a university or institutional environment is usually busy and crowded as a result of the presence of a high number of students in the area, and precautions are usually considered of utmost priority for drivers, motorists, and pedestrians in the city. With the growing number of students and prospective students in the Qingjiangpu District of Huai'an, it is important to ascertain that students are well knowledgeable of traffic ethics to avoid crashes, collisions, and other forms of accidents within and outside the university. A good understanding of traffic ethics helps students to be able to recognize risks on the road resulting from speeding, distracted drivers, and aggressive maneuvering, and the ability to understand the possible consequences of such actions. In a nutshell, a good awareness of traffic ethics can prevent violations and crashes.

Cahyono also explained that students have four important roles, which are the expectations of society, namely the role of change agent, social control, iron stock, and moral power.

Change agents: Students should have the option to become influencers in light of the fact that the country's present condition could be improved, especially the numerous cultural and society-driven issues. Students ought to make changes to this. Notwithstanding, rolling out these improvements should be made in an organized and unrushed strategy, beginning from the smallest extension, most specifically oneself, then spreading persistently until it at long last arrives at the degree that is expected.

Social control: The fact is that students should have the option to become good examples in the public eye, in light of their insight and understanding, with their degree of schooling, the standards that apply around them, and their thought processes. Moreover, students ought to develop a feeling of social consideration. They should think often about the local area since they are an essential part of society. This worry has not just appeared from exhibits or rampaging. Yet, from their splendid contemplations, conversations, or giving moral and material support to the general public and the city, by making a genuine commitment.

Iron stock (extreme future): Students can become iron stock, implying that they are supposed to be mentally willed persons who have the capacity and respectable character, who can later supplant past ages. They are resourceful, of great importance, and the country's potential for what's in store. In satisfying the job of the iron stock, students can enhance themselves with an assortment of information, both from an expert and cultural viewpoint, and remember to find out about different mix-ups that have happened in past ages.

Moral power (model): Students play a part as an ethical power, implying that they are expected to have great ethics, since students serve as good examples in society. All students' conduct is usually noticed and evaluated by the community. This means students should be great at setting themselves up and living side by side in society.

Preferably, students ought to be good examples in the public eye, one of which is traffic ethics. Before diving into the knowledge of traffic ethics, people obviously should initially figure out the meaning of ethics. According to Simorangkir, ethics comes from the Latin ethica. Ethos in Greek means standards, values, rules, principles for a good way of behaving [5]. Ethics is an aspect of philosophy that discusses virtues and standards. With ethics, people can act unreservedly and can be represented because each activity is constantly brought into the world from a free choice by continuously being willing to assume a sense of ownership with their activities,

since there are clear explanations behind their activities [6].

As indicated by Bertens, ethics has three definitions as follows. To start with, “ethics” can be utilized in the feeling of: virtues and standards that become a rule for an individual or a gathering in managing their way of behaving. Second, “ethics” likewise implies: an assortment of moral standards or values. What is implied here is a set of rules. Third, “ethics” has the significance: the study of fortunate or unfortunate, right or wrong [7]. Ethics just turns into a science when ethical prospects (standards and values about what is viewed as great and terrible) are underestimated in a general public, frequently without acknowledging it, becoming material for reflection for a deliberate and calculated research. Ethics here similarly implies a moral way of thinking. As a rule, it is separated into two, which are general ethics and unique or special ethics. To begin with, general ethics is connected with how people pursue ethical choices, ethical hypotheses, and fundamental ethical rules that guide human activities, as well as benchmarks in deciding whether an activity is positive or negative. Second, unique or special ethics, which are the use of essential moral standards in everyday issues [8].

Studies have also shown that there are some basic factors that ultimately lead to road crashes and injuries, as they can be unique and distinct in different countries and regions [9]. This factor can be categorized into three sub-elements, which are the human, environment, and vehicular factors. The human factor entails the behavior, perfection, attitude, and compliance towards traffic regulations, and this has been the longest-standing factor that leads to road crashes in the world [10]. The knowledge, behavior, and attitude of road users with other human factors, have taken the leading role as the cause of road crashes in China. This further emphasizes the lack of patient behavior amongst drivers, cyclists, and other road users [11].

## 2. Literature review (Theoretical and conceptual framework)

There are certain areas where ethics has been well established and recognized, such as in medical ethics, business ethics, animal ethics, food ethics, research ethics, engineering ethics, and many others. However, human activities suffer from lots of ethical issues, which proves a need for investigation and study [12]. With this, it is very evident that traffic ethics is at which requires that as the moral standards in this regard have been overlooked, neglected, proving particularly regrettable and detrimental to human safety. Taking into account ethics in traffic safety, accidents or crashes are just a point of many areas they affect, such as the environment and the economy at large.

The use of any form of vehicle mode (cars, e-bike, bicycle, etc.) daily poses a significant risk and threat to safety amongst road users (drivers, cyclists, or pedestrians) with different mental and psychological states [13]. Proper assessment of the possible risks should be morally considered among road users [14]. From previous research in Yinzhou, Ningbo 2016, data collected from the traffic police office shows that over 37,654 traffic accidents were recorded, as 7,725 are as a result of non-motorist vehicles with 1,159 at intersection and 6,566 on road sections as the number is only limited to those incidents reported to the traffic police [15].

It can be inferred that age plays a significant role in road users’ attitudes and behavior on the road. Youths have been seen to be less concerned about traffic ethics and obedience towards safe driving, and they can also be said to be less sensitive to risk and underestimate the chances of any danger happening [16]. This can also be commonly seen in China as most youth feel too confident on the road and end up ignoring some basic traffic ethics.

The theoretical foundation involved in traffic ethics cannot be overemphasized, as it paves the way for a broader understanding of the subject matter. This involves the ethical theories, principles, and philosophical

perspectives involved in understanding ethical behavior and the various decision-making in traffic-related situations. Having a good understanding of ethical behavior involves the philosophical and principal perspectives that assist individuals, societies, and organizations to investigate what is morally right or wrong. There are various principles and theories by different philosophers over the years on ethical behavior, such as utilitarianism, consequentialism, deontology, ethical egoism, feminist ethics, ethical relativism, social contract theory, legal compliance theory, virtue ethics, and many more. This study will only focus on those principles that are related to the subject matter and also their application to traffic ethics. Below are some of the theories that contribute to traffic ethics.

## 2.1. Consequentialism

The regularizing significance of the association between acts and results is self-evident. This is a good way to start with the theory of consequentialism. On this methodology, people start by noticing that, through our demonstrations, people shape the world they are in. At the point when one is contemplating whether to do something, say, miss class without any pressing reason, the principal thought they presumably have concerns about what will occur assuming they skip and what will occur in the event that they do not.

Those who adopt the consequentialist strategy never move past this thought. That is what they trust, in sorting out what to do, all that ethically matters concerns what will be achieved. This is not to recommend that consequentialists are barely worried about what causally follows from the demonstration. Rather, the result that a demonstration achieves remembers everything for the total world history where the demonstration is performed. Worry for results, in this expansive sense, depletes the ethical area, as indicated by consequentialists.

Assume one faces a perilous sickness. Their primary care physician gives them three choices: (A) They can have a medical procedure with sedatives, which will effortlessly fix them. (B) They can have a medical procedure without sedatives, which will tortuously fix them. Or then again (C) They can sit idle, in which case they will die in a horrifying demise. What should they do? If they are having a similar outlook as a consequentialist, they are thinking, “It should be that I am effortlessly restored.” And why would that be? Since (A) is better than (B), and (B) is better than (C).

In traffic decision-making, consequentialism could focus on results, for example, limiting mishaps or lessening traffic blockage. For instance, a driver might decide to go as far as possible to abstain from being late for a significant appointment, thinking that the advantages of showing up on time offset the expected dangers of speeding. In any case, according to a consequentialist viewpoint, this activity would possibly be thought of as ethical if it at last prompts improved outcomes, for example, no accidents happening subsequently.

## 2.2. Legal compliance theory

In China, legal compliance theory is an integral part of transportation, which focuses on the importance of adhering to traffic laws and regulations to ensure road safety and promote social harmony. Likewise, the guiding framework for traffic control and management, safety, policy amendments a practice, and public discourse on road safety and transportation governance. By concentrating on the importance of legal compliance, this theory helps to create a safer, more orderly, and sustainable transportation system for the benefit of its people.

Legal compliance theory stresses the commitment of all road users to submit to traffic laws and guidelines. It sets that adherence to laid out rules and guidelines is fundamental for guaranteeing smooth and methodical traffic movement, decreasing the chances of road mishaps, and safeguarding the freedoms and security of all

road users The theory recognizes the power of traffic laws and guidelines as laid out by the public authority and upheld by policing. It highlights the significance of compelling implementation instruments to dissuade infringement and guarantee compliance with traffic rules.

It also perceives the job of public mindfulness and training in advancing legal compliance among street clients. It stresses the requirement for complete traffic wellbeing schooling programs pointed toward improving information on traffic laws, encouraging dependable way of behaving, and developing a culture of compliance and regard for the law. The theory highlights the social obligation of people and associations to contribute to the upkeep of traffic order and security. It accentuates the moral commitment of drivers, people on foot, cyclists, and other street users to focus on wellbeing, show thought for other people, and conform to traffic laws for the aggregate advantage of society.

Legal compliance theory recognizes the need to impose punishments and ramifications for infringement of traffic laws and guidelines. It advocates for quick and fair authorization of punishments to deter dangerous way of behavior, advance responsibility, and build up the significance of legal compliance. Likewise, it perceives the requirement for nonstop improvement in traffic laws, guidelines, and authorization components to address developing difficulties and guarantee the adequacy of traffic management efforts. It empowers continuous assessment, exploration, and transformation of arrangements and practices to upgrade street wellbeing and traffic effectiveness.

## 2.3. Understanding basic traffic ethics for motorists and cyclists

Adhere to traffic regulations: Cyclists and motorists should comply with all traffic regulations, including halting at red lights and stop signs, respecting pedestrians, and utilizing blinkers.

Shared lane: Cyclists reserve the option to utilize the lane very much like motorists, so they should be conscious and share securely.

Self-consciousness of environmental factors: Cyclists and motorists ought to know about their environmental elements consistently, really taking a look at mirrors and vulnerable sides prior to moving to another lane or making turns.

The use hand signals: Cyclists ought to make use of hand signals to demonstrate when they are turning or halting, and motorists ought to know about these signals and yield to cyclists when necessary.

Keep safe distance: Motorists should give cyclists something like 3 feet of room while passing, and cyclists ought to ride in an anticipated way to stay away from unexpected developments that could cause collision or accident.

Be patient and polite: Both cyclists and motorists ought to be patient and considerate to one another, giving each other the space and regard they deserve.

Wear appropriate gear: Cyclists ought to continuously wear a head protector and splendidly shaded dress to expand perceivability (recognizability), and motorists ought to constantly wear a safety belt and keep away from interruptions while driving.

Emergency Readiness: Both cyclists and motorists should be mentally ready for emergencies or unforeseen situations that might arise on the road, carrying important devices or gear for fixes.

## 2.4. Understanding basic traffic ethics for pedestrians

Fundamental traffic ethics for pedestrians are fundamental to ensure compliance for security and advancing smooth communications with other road users. Here are a few essential rules that pedestrians ought to comply with.

Comply with traffic signals and signs: Pedestrians ought to submit to traffic signals, signs, and crosswalk markings. This incorporates trusting that the walker signal will get through at intersections and just crossing roads at assigned crosswalks or pedestrian crossings.

Utilize assigned crosswalks: Pedestrians ought to utilize assigned crosswalks or person on foot crossings whenever the situation allows. Crossing at assigned areas raises drivers' awareness and lessens the risk of accidents.

Look left and right before crossing: Before crossing a road, pedestrians ought to look left and right to guarantee no cars are moving in the opposite direction. In any event, while crossing at assigned crosswalks, pedestrians ought to stay cautious and watch for vehicles that may not stop. It is important for pedestrians to be vigilant because not all drivers are in their right state of mind and might lose control at any point.

Keep eye contact with drivers: While crossing roads, pedestrians ought to attempt to visually engage with drivers to guarantee they have been seen directly in the eyes. This can assist with forestalling accidents brought about by miscommunication or misconception among pedestrians and drivers.

Remain apparent or visible to drivers: Pedestrians ought to make themselves noticeable to drivers, particularly in low-light circumstances or while walking around evening time. Wearing splendid or intelligent apparel and utilizing electric lamps or intelligent adornments can further create awareness and decrease the risk of accidents.

Avoid distraction: Pedestrians ought to abstain from utilizing electronic gadgets, for example, cell phones or earphones, while crossing roads or walking close to traffic. Interruptions can hinder attention to environmental factors and increase the risk of accidents.

Cross securely: Pedestrians ought to wait for a protected hole in traffic before crossing the road. While crossing different paths, they ought to cross each path in turn and check for traffic between paths.

Be aware of traffic movement: Pedestrians ought to be aware of the progression of traffic and try not to disturb the development of vehicles. This incorporates staying away from unexpected developments into traffic or crossing roads at hazardous areas.

Walk confronting traffic: In the event that walkways are inaccessible, pedestrians ought to walk confronting approaching vehicles. Strolling against the progression of traffic permits pedestrians to see moving toward vehicles and respond as needs be.

Watch for turning vehicles: Pedestrians ought to be wary while crossing roads where vehicles are turning. Drivers may not necessarily, in all cases, see pedestrians crossing or may turn without yielding, so pedestrians ought to be ready to pause and give way if necessary.

By following these essential traffic ethics, pedestrians can be assured of their own security and the wellbeing of others. Being mindful, watchful and having the thought for other road users are key rules that pedestrians ought to focus on while exploring traffic conditions.

One of the pivotal modes of urban road traffic in China is non-motorized vehicles, which seems to be the most adopted by students in this study, which also accounts for a great proportion of crashes, fatalities, and injuries in road traffic accidents. Although research and literature reviews on the behavioral patterns and ethics of non-motorized vehicle accidents are still quite inadequate, this shows the need for more study and research focusing on non-motorist as students are the best example of the use of this mode of transportation.

However, there are still lots of limitation to this study as from observation, most accidents are not reported to traffic police office as motorist prefer to manage and deal with the situation outside police involvement (likely minor accidents) which are still as a result of negligence, distraction or unawareness on the part of the road users.

The purpose of this study is not to accurately or perfection on the traffic ethics and behavior but to raise more awareness on the need for self-consciousness, awareness, mental preference and safety of other road users, most especially as there a growing increase in the use of bicycles, e-bike and other form of non-motorized vehicles on the bike lane.

**Figure 1** shows a simulated traffic light at a road intersection with three vehicle lanes, a pedestrian lane, and a bike lane at the four cardinal directions of the intersection, as most major roads are designed. The green lines or curves show when road users have the right of way, while the yellow indicates the lanes can possibly have the right of way when the traffic light turns red. Due to movement across all the green lanes at this intersection with the interaction between all forms of road users requires adequate concentration and an eye for the safety of others. From observation, it can be mostly seen as a time where road users walk, ride, or drive a bit carefree, as it is their right of way, and this has led to a significant number of accidents over the years.

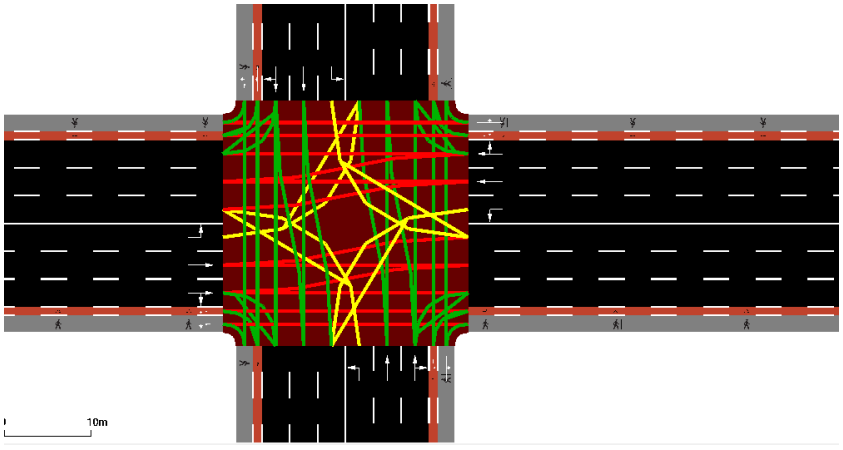


Figure 1. Picture of a simulation network at a point of traffic intersection

## 3. Materials and methods

In this study, a quantitative and qualitative descriptive method of research using an explanatory mixed method [17]. The data collection method is via Microsoft Forms, as the software is available to all participants. The population of this study will be university students in Qingjiangpu District Area, Huai'an City, Jiangsu Province in China.

### 3.1. Method of collecting data

Observation and a questionnaire were employed as data collection methods. This will be done by collecting data from the traffic ethical areas of road safety. The questionnaire contains 6 demographic questions and 11 traffic ethics questions on road safety, awareness, and traffic intersections. The aim is to assess the level at which students have a good understanding and knowledge of traffic ethics as regards safety and its importance to road behavior within the district. With about 22,000 students, both domestic and international students from different institutions within the district, a definite sample size formulae were employed to calculate the number of respondents for the study. A semi-structured online questionnaire was created, which helped to ensure reach to students in the institution, as a QR code is needed to access the questionnaire.

Sample Size = $[z^2 * p(1\text{-}p)] / e^2 / 1 + [z^2 * p(1\text{-}p)] / e^2 * N]$

Where:

$N$ = population size

$z$ = z-score

$e$ = margin of error

$p$ = standard deviation

$N$ = 22,000, $z$ = 95% or 1.96, $e$ = 0.05, $p$ = 0.5

Sample size = $(1.96) * 0.5(1-.5)/(0.05)^2$

$1 + ((1.96)^2 * 0.5(1-0.5)/ (0.05)^2 * 22{,}000 = 378$ respondents

# 4. Results and discussion

## 4.1. Demographic findings

From the pie-chart and **Table 1** below, it can be seen that 39% percentage of the respondents are between the age group of 16–20 years, 44% are between the age group of 21–25 years, 14% are between the age group of 26–30 years and 3% are between 31 and above, 67% of the respondents are male while 33% are female, it can also be seen that 76% of the respondents are domestic students (Chinese students) while 24% of the respondents are international students, 58% of the respondents are undergraduate students and 42% are postgraduate; the data also show that 63% of respondents mostly use bicycle, 27% use e-bike/motorcycle, 7% use car while 3% makes use of public bus; 43% responds that they have received formal training on traffic safety and ethics, 46% responded no while 11% are not sure if they have received formal education or not.

**Table 1.** Demographic information of the respondents

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Age | 16-20 | 148 | 39 |
| | 21-25 | 168 | 44 |
| | 26-30 | 5 | 14 |
| | 30 and above | 11 | 3 |
| Gender | Male | 254 | 67 |
| | Female | 126 | 33 |
| Nationality | Domestic student | 287 | 76 |
| | International students | 93 | 24 |
| Academic Level | Bachelor | 220 | 58 |
| | Postgraduate | 160 | 42 |
| Transport mostly used | Bicycle | 239 | 63 |
| | Car | 27 | 7 |
| | E-bike/Motorcycle | 102 | 27 |
| | Public Bus | 12 | 3 |
| Formal training on traffic ethics and safety | Yes | 162 | 43 |
| | No | 175 | 46 |
| | Maybe | 43 | 11 |

From **Table 1** and **Figure 2**, 67% of the respondents are male, while 33% are female. 76% of the respondents are domestic students (Chinese students), while 24% of the respondents are international students. 58% of the respondents are undergraduate students and 42% are postgraduate students. It is also determined from the study that 63% of respondents mostly use bicycles, 27% use e-bikes/motorcycles, 7% use cars, while 3% make use of public buses. 43% responded that they have received formal training on traffic safety and ethics, 46% responded no, while 11% are not sure if they have received formal education or not.

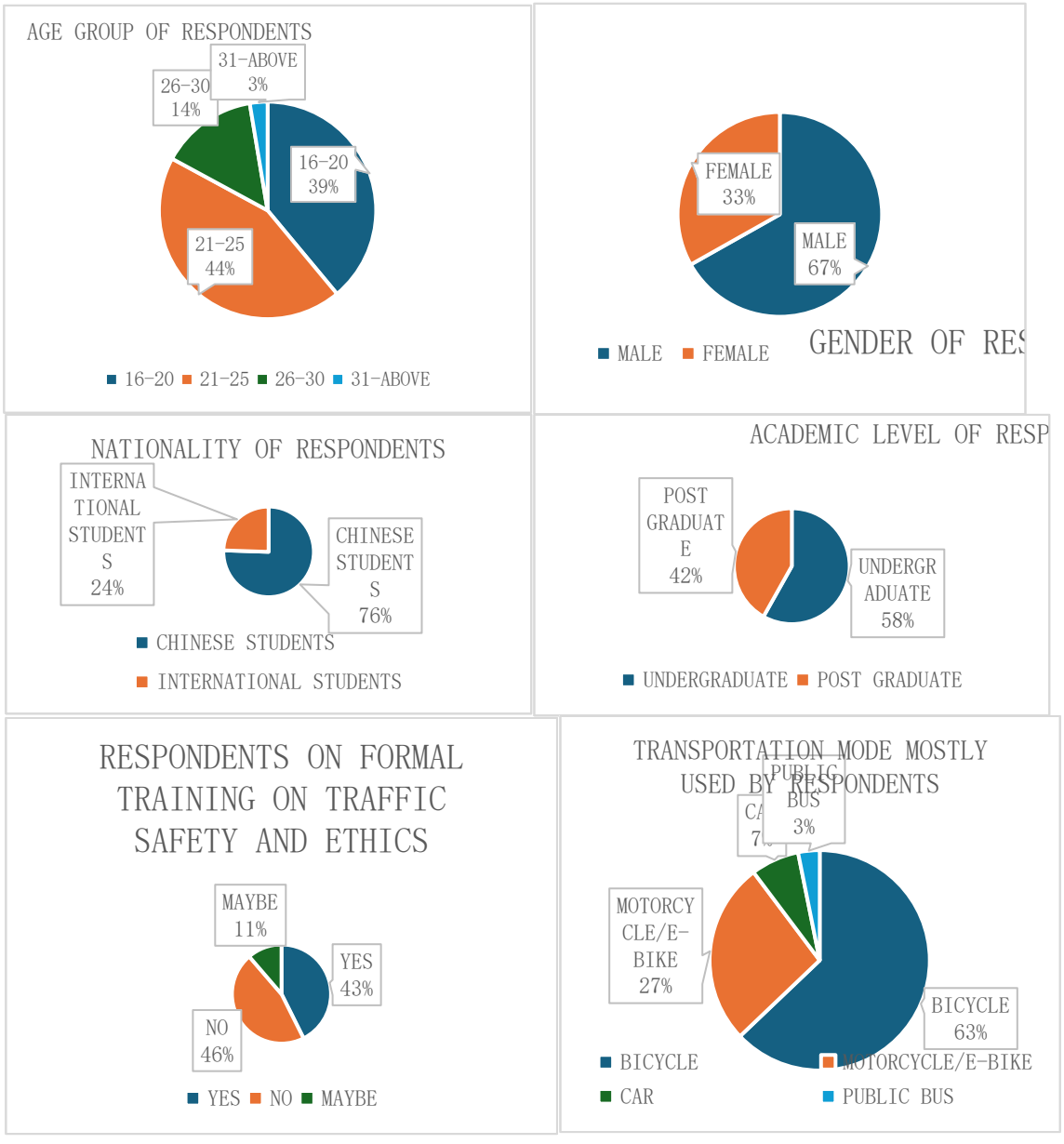


Figure 2. Pie chart of demographic information of respondents

Eleven questions were administered in this questionnaire to understand respondent compliance and knowledge of traffic ethics, with 360 respondents. Based on the first question, it can be observed that 35% of the respondents are not quite familiar with the traffic laws and regulations of the city, 52% believe they are somewhat familiar, 12% are certain that they are familiar with the traffic laws, while only 1% are not familiar.

This gives rise to a mean of 2.76 and a standard deviation of .673.

**Table 2** shows the 380 respondents to the question on their familiarity to the traffic and regulation of the city as it can be deduced that most of the respondents do not have a comprehensive knowledge of the traffic laws guiding the city with a mean of 2.76 and standard deviation of 0.673 as it is slightly positively skewed.

**Table 2.** Analysis of the questionnaire using descriptive statistics

**ANALYSIS USING DESCRIPTIVE STATISTICS**

| | | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | Valid | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | | 2.76 | 3.24 | 2.28 | 2.46 | 2.88 | 3.18 | 3.39 | 3.27 | 3.39 | 3.14 | 3.16 |
| Std. Error of Mean | | .035 | .039 | .035 | .036 | .038 | .037 | .041 | .042 | .037 | .039 | .042 |
| Median | | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| Mode | | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Std. Deviation | | .673 | .760 | .679 | .709 | .742 | .719 | .804 | .809 | .717 | .767 | .819 |
| Variance | | .453 | .577 | .461 | .503 | .550 | .517 | .646 | .655 | .513 | .588 | .672 |
| Skewness | | .123 | .082 | -.112 | .354 | .393 | -.366 | -.129 | -.220 | .211 | .397 | -.357 |
| Std. Error of Skewness | | .125 | .125 | .125 | .125 | .125 | .125 | .125 | .125 | .125 | .125 | .125 |
| Kurtosis | | -.491 | .522 | -.426 | .597 | .777 | .497 | .509 | .269 | .340 | .882 | .307 |
| Std. Error of Kurtosis | | .250 | .250 | .250 | .250 | .250 | .250 | .250 | .250 | .250 | .250 | .250 |
| Range | | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Minimum | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Sum | | 1048 | 1230 | 867 | 936 | 1094 | 1208 | 1290 | 1241 | 1289 | 1192 | 1200 |
| Percentiles | 25 | 2.00 | 3.00 | 2.00 | 2.00 | 2.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| | 50 | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| | 75 | 3.00 | 4.00 | 3.00 | 3.00 | 3.00 | 4.00 | 4.00 | 4.00 | 4.00 | 3.00 | 4.00 |

On a scale of 1–5 (1: Never, 2: rarely, 3: Sometimes, 4: Often, 5: Always), it can also be seen from the statistical table and the histogram below that most respondents do not abide to the traffic ethic on the use of mobile phone while driving on the road with a mean of 3.24 and standard deviation of 0.76. It can be seen that a percent of respondent believes they do not use mobile phone while on the road, 11% of respondents agrees that they rarely do, 56% of respondents feel they sometimes, 27% of respondents believes they often does, while 5% truthfully think they always use their mobile phone on the road.

Experiencing an accident on the road is a common occurrence on the road in which can be as a result by traffic violations. From this study, 11% of respondents feel they never experience an accident from a traffic violation, 51% of respondents slightly agree, as they believe they also rarely experience this. 36% think they sometimes experience accidents from traffic violations, 2% of respondents beg to differ as they believe it is an often occurrence, while no respondent thinks it is an event that always happens. This results in a mean of 2.28 and a standard deviation of 0.679 from the analysis.

Experiencing behavior on the road considered unsafe/unethical, 6% of the respondents picked Never, 48% chose Rarely, 41% chose Sometimes, 4% believe it is an event that happens often, while 1% thinks it happens always, with a mean of 2.46 and a standard deviation of 0.709.

The use of protective gear as drivers or riders is considered one of the most important road safety guidelines to abide by. 2% truthfully accept that they do not use protective gears, 27% are of the opinion that

they rarely use protective gears, 57% reckon they do sometimes, 12% maintain they wear often while 3% feels they fully abide to wearing protective gears; with a mean of 2.88 and standard deviation of 0.742.

2% of respondents believe they do not get distracted while on the road, 12% feel they are rarely distracted, 50% think they do get distracted while on the road, 30% believe it happens often, while only 1% believe, due to some reasons, they are always distracted.

2% of respondents feel they are not bothered by checking both sides of the traffic at the intersection point, 7% rarely, 49% sometimes, 34% often and 8% always check the two sides of the traffic at the point of intersection, which results in a mean of 3.39 and standard deviation of 0.804.

Abiding by traffic signs and signals is quite important towards the safety of road users, as 2% never abide, 12% rarely abide, 48% sometimes abide, 33% of respondents often abide, while 5% always abide; with a mean of 3.27 and a standard deviation of 0.809.

3% of the respondents believe they never give a safe distance while driving on the road, 14% believe they rarely do, 50% sometimes do, 30% often give safe distance, while 3% reckon they always give safe distance; with a mean of 3.39 and a standard deviation of 0.717.

1% of respondents never park at designated areas/spaces, 13% rarely park at the right space, 62% sometimes, 18% often do, while 6% always, with a mean of 3.14 and a standard deviation of 0.767.

3% of the respondents chose never stop at a traffic light when no vehicle is in sight, 14% rarely, 50% responded that they sometimes, 30% often, while 3% always, with a mean value of 3.16 and a standard deviation of 0.819.

# 5. Conclusion, suggestion, recommendation, and limitation

## 5.1. Conclusion

Ethics plays a pivotal role in existence, as the knowledge of it in traffic and road safety cannot be overemphasized. The place of human error and negligence is ranked as one of the highest causes of road accidents, which results from a lack of adherence to traffic ethics and safety. From the study, it can be seen that there is a high level of negligence and distraction among road users, most especially the young adults, on whom the study focused on students who are the dominant force in society. It can also be observed from the study that most of the population of young adults and student makes use of bicycles and e-bikes as a means of transportation, which allows for more attention on the road path for bikes and bicycles. Research has also shown that most casualties from lack of adherence to traffic ethics and safety that results in accidents occurs at traffic light intersection, with most people being either impatient or not look at the both side of traffic before moving, even when it is their right of way. It can be seen in the image presented in the previous chapter illustrating the movement of traffic around road intersection.

## 5.2. Suggestion

There are lots of traffic and road signs that have been implemented over the years, which have become a pillar to ensure safety on the road. From this study, as result of the high record of accidents at traffic intersection points, and also from the responses of respondents from the study, it is believed the introduction of traffic sign/signals in the bike lane, few miles before the point of intersection can also help keep road users alert and attentive before they get to the traffic signal intersection (**Figure 3**). Also, it can be worded between the pedestrian crossing lane. Traffic signs in form of prohibition of the use of mobile phone at road intersection can

also be a useful traffic control and safety device to keep road users alert of any possible impending danger that might arise from any driver or motorist losing control, careless driving or drunk driving on the road as there lots of possible factors that can affect their behavior on the road.


Figure 3. Possible road signs to adopt

Furthermore, since most adult and real-life education are learnt in higher institution, as it can prove to be important that institution setup a mandatory orientation program in partnership with the local traffic authority in the area, as part of the welcome back to school activity for new students at the beginning of each academic year on traffic ethics education which will cover safety, laws and regulation in the city, and likewise a medium to introduce new updates, regulations and laws to students, statistics of road crashes and injuries in the past and the need to be more careful while on the road. Likewise, a survey test can be taken at this orientation to get feedback from students, which can prove to be an important decision-making tool for future traffic safety and control measures by the designated traffic office in the city. It is understood that most cities, provinces, countries have little or much differences in traffic regulations, as this will be an avenue to help them understand the differences that applies in the current city they are in; most especially for new students as a good number of them are international students from countries, provinces, cities or states with different road and traffic demand, regulation, safety and ethics. This annual traffic ethics education program will also provide an avenue for new traffic policies to be well-communicated with the students, as cities with institutions are highly populated due to the presence of students.

## 5.3. Recommendation

For further study, the idea of setting up a camera sensor that can detect cyclist in the bike lane using their mobile devices by sounding an alarm as a means of getting their attention ahead of the traffic intersection ahead. This can also prove to be an upgrade as the need to pay close attention to the bike lane is increasingly growing every day, with an increase in its users.

## 5.4. Limitations

There are various limitations to the study as some students were reluctant to fill out the questionnaire, thinking it could be implicating to them. Also, the lack of access to the local traffic police statistics on road crashes and injuries can also be said to be another limitation to the study.

## Disclosure statement

The authors declare no conflict of interest. All data were gathered and analysed in compliance with ethical research guidelines. Participation in the study was voluntary, and all individuals provided informed consent prior to data collection. The researchers confirm that the study adheres to institutional and national research ethical rules and that no personal or identifying information about participants was shared.

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