Driving Behavior of Educated Youth in Bangladesh

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Proper traffic safety is defined as systems and techniques used to safeguard road users against dying or being severely injured. Educated and internet-using Bangladeshi drivers took part in a questionnaire about their emotional stability on an online platform with more than 100 questions comprising two parts. While one of the part outlines the physiological, cultural, and socioeconomic factors and driver education, in another part, an 18-point Driver's Behavior Questionnaire was introduced to the responders. About 40% of the surveyed drivers in the poll were inexperienced. However, 49% of people prefer to ride two-wheelers. Moreover, 70% of surveyed drivers hold valid driver's licenses. At the same time, 35.2% of those were college graduates. Even 34.8% of accidents were caused by excessive speed and non-aggressive driving. In addition, age and degree of education were significant indicators of distracted driving violations.

driving simulator unusual driving behavior road safety

1. Introduction

In recent years, the number of individuals killed or wounded in automobile accidents has risen considerably. The threat they represent to humanity is one of the most critical concerns the world has ever faced. They may cause bodily and psychological suffering as well as financial turmoil. By 2030, it is predicted that road traffic accidents will be the fifth most prominent cause of mortality globally, ranking fifth overall ^[1]. The strategies and procedures implemented to protect road users from dying or being badly wounded are road traffic safety ^[2]. According to the Accident Research Institute (ARI) of Bangladesh University of Engineering and Technology (BUET), 56,987 persons have died in 58,208 vehicle accidents in Bangladesh during the previous two decades. In addition, 6686 people were killed, and 8600 were wounded in 4891 traffic accidents in Bangladesh in 2020, according to Bangladesh Passengers Welfare Association's (BPWA) annual road accident monitoring report. A recent report estimated that approximately 1.35 million people die in road accidents every year. Despite accounting for only 60% of all vehicles on the road, low and middle-income countries account for 93% of all fatalities. Road, vehicle, and human factors are essential in a car accident (drivers). Human factors are to blame for nearly 70% of all traffic accidents ^[3].

A driving simulator is a research tool, as it is used for various purposes in the industry sector and university research labs. The world's top automobile manufacturers, like BMW, Renault, and Ford, maintain their development for humanity with these types of tools. In the university or any institute of the vehicle having a lab, the researchers study drivers' behavioral changes and reactions and check out the training sections under various

conditions. Driving simulators are used in educational institutions and private companies to teach amusement and driver's education courses. They are also used to monitor driver behavior, performance, and attention in human factors and medical research. They can create and assess new cars or sophisticated driver assistance systems in the automobile industry ^[4]. Many driving assistance technologies are being developed in Europe to help minimize traffic accidents. The threshold in such a system is frequently established depending on the average driver's performance. However, this option will likely not provide adequate driving assistance to the driver when doing various activities ^[5].

A concept of the environment is included in **Figure 1** and **Figure 2**. For all drivers, researchers need to preserve some preloaded algorithm data, which should be preserved for executing the simulator. Users can practice driving on this simulator using real-world equipment after incorporating data.



Figure 1. Constructed system for experiment data analysis and warning algorithm development.



Figure 2. Proposed internal environment for driving simulator.

In the case of Bangladesh, there is substantially less information available concerning unusual driving behaviors. This problem has not been thoroughly investigated in Bangladesh, where acquiring a driver's license is not the most challenging undertaking. There were no studies or data identified in this area for Bangladesh until 2021. Research has utilized the DBQ to measure deviant driving behaviors in other nations, but no study has been undertaken in Bangladesh.

2. Driving Behavior of Educated Youth in Bangladesh Considering Physiological, Cultural and Socioeconomic Variables

Evans (1996) showed that behavior kept a higher impact intensity than driving activities on highway security ^[6]. De Winter et al. (2010) demonstrated that the behavioral actions of drivers are a significant impact factor in accidents that happen on highways. The most effective tool for assessing driving habits in the transformational research section is the Driving Behavior Questionnaire ^[7]. Reason et al. (1990) surveyed 520 United Kingdom drivers to

explore the defilements, harmful error, safe lapses, and unusual drivers' behavior, assisted by the DBQ ^[8]. Using the DBQ, G. Fancello et al. & F. Wang et al. (2020) experimented in Australia, Laujunen et al. (2004), and Sullman et al. (2002) trialed the DBQ in Sweden, Finland, and New Zealand, respectively, Mesken et al. (2002) investigated in the Netherlands, and Sümer et al. (2002) completed the task in Turkey and Spain. After a while, the research work was again done with the help of the DBQ, Nordfjærn et al. (2014), Mallia et al. (2015), Kaiser et al. (2016), Batool & Carsten (2017), and Muhammad & Jing (2020) inspected the drivers' unusual behavior ^{[9][10][11][12][13][14]} [15][16][17].

Coeckelbergh et al. (2002) examined the influence on driving characteristics of occipital cortex deficits and predicted functional fitness [18]. Bella et al. (2005, 2007) revealed that calibrating and validating the driving simulator could be used to develop and test the effectiveness of temporary traffic signals on highways. The driving simulator has the potential to be used as an analyzing tool for the speed on two-lane roads, and the impact of road alignment on motorists was also presented [19][20]. Van Der Horst et al. (2007) inspect the effect of roadside infrastructure on drivers' rapidity and cross positioning of their vehicles in their driving simulator research. They investigated some methods for inducing qualitatively distinct patterns of subjective response using driving simulators. ^[21]. Yan et al. (2008) considered if a driving simulator could measure traffic safety at signalized junctions and found a novel method by comparing crash analysis for field data with surrogate safety measures from the simulator ^[22]. De Winter et al. (2009) developed a theoretical framework to measure driver expertise in work performance, infringements, and mistakes ^[23]. Francesco Galante (2010) et al. analyzes the speed of cars on a portion of a rural road that intersects a medium-sized town area in 2 different design scenarios, including urban transport management ^[24]. Maya Abou-Zeid (2011) et al. reviewed university students' aggressive driving behavior by utilizing a driving simulator to simulate various traffic situations and evaluate drivers' reactions to those events [25]. A. Calvi (2012) et al. studied the findings of a driving simulator study that looked at performance when entering a divergence region and decelerating during the exiting maneuver ^[26]. Basacik (2012) et al. looked into how singing while driving impacts driver performance. Their findings show that singing while driving had no noticeable effect on driving performance compared to only listening to music [27]. Dixit (2014) et al. used a controlled virtual reality experiment that studied the personal hazards of driving behavior ^[28]. Florence Rosey et al. (2014) piloted a comprehensive survey to calculate the effect of a message shown on a variable message sign ahead of an isolated four-way connected, busy road ^[29]. A. Calvi (2018) set out to find treatments for excessive motoring speed on twolane country roads and an efficient solution to excessive speed driving [30]. Some frequent issues like driver distraction, chauffer characteristics, and the road environment were synthesized to establish a solution by Panagiotis et al. (2018). These factors have a significant impact on driving attributive errors [31]. Hussain et al. (2019) assessed the physical and objective environment for the driving simulator ^[32]. Bleydy et al. (2019) employed an intervention mapping technique as a framework to create their simulated driving treatment. They developed a simulator system that increases the need for a driving simulator [33]. Darko et al. (2020) looked at how traffic signaling elements (road markings and traffic signs) impact young drivers' behavior when driving at night [34].

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