



Rating road traffic education

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ABSTRACT

In the context of road safety, improvements in road traffic education have been recognized in several countries as an instrument for reducing road accidents. However, the level of road safety education imparted by different institutions lacks an objective performance measure regarding the level of awareness that different participants in the transport process have concerning road transportation risks. Based on an analytical hierarchy process to weigh the relative importance of different questions, in this paper, the fundamentals of a road safety questionnaire are presented and discussed, including the corresponding references for the contents of each question. This test was designed for six road transport participants: car drivers and passengers; public bus, motorcycle and bicycle riders; and pedestrians. For each of these participants, six areas of knowledge were addressed: applied situations, courtesy and urbanity, infrastructure, safety and human factors, traffic signals and rules/recommendations. The target population for applying the test was the inhabitants of the City of Santiago de Queretaro, Mexico. For a grading scale of 1 to 10, the lowest and highest grades were obtained by motorcycle riders (5.72) and pedestrians (8.84), respectively, which denotes the need for better instructions for motorcyclists regarding road safety.

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1. Introduction

The frequency and severity of road crashes are influenced by factors related to vehicle and road design and the behavior of road users (Davis, 2014). Specifically, Rudin-Brown, Edquist, and Lenné (2014) recognize that the level of driving education is a contributing factor for road accidents. Increased global demand for road transportation and the growing population of road users generates pressure on road user education systems (Rosenbloom & Eldror, 2014). Therefore, the World Bank finances road safety education programs to diminish the rate of road accidents in developing countries (World Bank, 2013). Nevertheless, in the case of developed countries for which the lowest levels of road accidents have been reported, the positive effect of road safety education has only been marginal (Christie, 2001; Washington, Cole, & Herbel, 2011). In this respect, assuming that this output is the result of a better general education and infrastructure available to road users in developed countries, the potential to improve road safety in developing countries by upgrading road safety education is available because of the lack of investment resources in developing countries. According to Jacobs and Sayer (1983): “the sum of

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money available to spend on road safety improvements, road rehabilitation and maintenance, police enforcement, etc. will be severely limited”.

Because the implementation of strategies for improving road safety education can be a priority for some States, it is crucial for these States to have an objective perspective of the areas that need to be addressed and improved, as a function of the road transport participant (e.g., driver, pedestrian public bus user) and the domain needed to be improved (e.g., situations, signals). Measures and strategies for improving road safety education should be derived, however, from the analysis of the overall situation that a certain economy is facing in this respect.

Through the analysis of data regarding the safety and the efficiency of a transport system, specific tools can be developed to improve the mobility potential and transport safety of any given society (European Commission, 2012). Shen et al. (2014) propose a benchmarking approach to compare the road safety performance of different countries based on global strategies that focus on particular safety objectives. In this regard, the ethics of cost-benefit analyses are discussed by Van Wee, Hagenzieker, and Wijnen (2014), noting the needs for internationally sensitive indicators beyond utilitarianism. By analyzing the policies implemented in Costa Rica for improving traffic safety through an educational and training scheme that focused exclusively on users’ “acting manners”, Tencio (2008) suggests that any policy in this regard, should be comprehensive, and not based on unproven hypothesis. In the context of urban sustainability, transport and education, Hiremath, Balachandra, Kumar, Bansode, and Murali (2013) describe the methodologies that have been proposed for performing sustainable mobility assessments, involving the analysis of educational principles aimed at gaining a higher level of awareness for the population regarding the transport issue.

In relation to the use of specialized training equipment, the effectiveness of considering realistic tools for training vehicle drivers is still under discussion: while some authors (Beanland, Goode, Salmon, & Lenné, 2013; Rosenbloom & Eldror, 2014) did not find any significant advantages of using realistic driver simulators over traditional training methods, De Winter (2013) reports that simulator-based pre-license training can realistically predict and potentially enhance licensed drivers’ performance. In this respect, it should be noted that the need for creating realistic training environments has been suggested previously (Rothengatter, 1981).

Studies that address road safety education for particular road infrastructure users have been reported in the literature: Duperrex, Bunn, and Roberts I. (2009) focused on analyzing pedestrians; Twisk, Vlakveld, Commandeur, Shope, and Kok (2014) analyzed bicyclists and pedestrians; Glendon, McNally, Jarvis, Chalmers, and Salisbury (2014) attended pre-drivers; and Twisk and Colin (2006) worked on drivers.

In this context, according to the Institute for Road Safety Research (SWOV) (SWOV, 2010) concerning road traffic education, the individual reporting of road users’ performance should be the first activity for improving their education and performance. This is the type of reporting on which the indicator in this research is based, involving assessments of users’ behavior and their level of knowledge. In this respect, Morley and Harris (2006) explain that a healthy safety culture is multi-dimensional, involving well-developed norms and rules while implying an informed and healthy attitude towards risk from road users. However, for Hughes, Newstead, Anund, Shu, and Falkmer (2014), the term safety culture has not been properly defined.

In the light of the previous review, it seems that no definite global tool or approach can be identified for improving road education. However, what is definitive is the need that developing countries such as Mexico have to undertake actions to improve road safety education. However, any effort in that sense has to consider the constraints of these economies, the culture and the level of overall education. In Mexico, it is estimated that between 70% and 90% of traffic accidents are attributed to the driver, with human errors and driver offenses to traffic rules as the two main contributing elements (García, Acosta, & Vázquez, 2010). For the traffic on Mexican federal highways, it has been reported that 72.9% of road mishaps can be attributed to driver-related factors (IMT, 2013). For the State of Queretaro, where the City of Queretaro is located, 93% of road accidents are attributed to drivers’ performance (CONAPRA, 2010a).

In this paper, an analytical instrument that measures the level of awareness that the public transport infrastructure users have regarding sound and safe transport practices is proposed, under the consideration that this instrument could serve as the basis for assessing the whole public transportation system’s preparedness to cope with road safety issues. This instrument considers six urban transport infrastructure users: car drivers and passengers; public bus, motorcycle and bicycle riders; and pedestrians. The tool identifies the relevant variables for performing an evaluation of the prevailing situation and for formulating a preliminary view of potential corrective actions. The instrument represents a questionnaire whose design is based upon the review of different methodologies, including those used in Holland, Spain, Costa Rica and in the State of Queretaro. The results from this instrument in the Mexican City of Santiago de Querétaro are discussed. This paper is organized as follows: a review of the exiting methodologies for assessing education; the resulting questions and an analysis of the results when this test is completed by inhabitants of the Mexican City of Queretaro. The most important remarks and recommended actions are subsequently described.

2. Methodology

The proposed methodology is described in the light of two evaluation methodologies, which are closely related with the one that is proposed in this paper. One is the methodology used by the Mexican National Education Assessment Center (CENEVAL); and the other represents a multicriteria model. The “CENEVAL methodology” represents a series of systematic

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