ViSTREET: An Educational Virtual Environment for the Teaching of Road Safety Skills to School Students

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ViSTREET: An Educational Virtual Environment for the Teaching of Road Safety Skills to School Students

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Abstract. Virtual reality (VR) has been prevalently used as a tool to help students learn and to simulate situations that are too hazardous to practice in real life. The present study aims to explore the capability of VR to achieve these two purposes and demonstrate a novel application of the result, using VR to help school students learn about road safety skills, which are impractical to be carried out in real-life situations. This paper describes the system design of the VR-based learning environment known as Virtual Simulated Traffics for Road Safety Education (ViSTREET) and its various features. An overview of the technical procedures for its development is also included. Ultimately, this paper highlights the potential use of VR in addressing the learning problem concerning road safety education programme in Malaysia.

Keywords: virtual reality, educational virtual environments, road safety education, instructional technology.

1   Introduction

The utilisation of computer simulations in enhancing teaching and learning has become popular in recent years largely due to technological advancements in three-dimensional (3D) graphic processing and declining costs of computer peripherals. Virtual reality (VR) is a more recent technology that is used for computer simulations. VR enables users to interact with three-dimensional data, creating a potentially powerful interface to both static and dynamic information [1]. Studies conducted by various researchers [2, 3, 4, 5] further reveal that VR offers a large number of possibilities in instructions due to its capabilities, which are absent in other tools. The key capability is that VR helps learners to experience and visualise directly some physical properties of objects and events that are unavailable or unfeasible in the real world due to distance, time, cost, or safety reasons. In light of this, VR is regarded as a potential instructional tool to provide simulated training and skills teaching in dangerous or logistically impossible circumstances such as roads with heavy traffics, house on fire or coal mine. VR is thus increasingly eminent in prevention training as well as emergency or disaster management [6].