

# **Experiential Learning for the 21<sup>st</sup> Century: Using Interactive Augmented Reality to Demonstrate Risk to Children in Outdoor Simulated Road Environments**

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## **Abstract**

Constable Care Child Safety Foundation commenced operation of WA's only children's road safety experiential learning centre in July 2017. The Safety School provides a hands-on road safety excursion for primary-aged students, combining a fully-functional pedestrian, bike and public transport layout with the latest in education technology. In a world-first, the Safety School uses a purpose-built augmented reality application on handheld tablet devices to allow students and teachers to interact with and make decisions about travel risks overlaid throughout the 3,500 sqm outdoor environment. The curriculum-linked app allows real-time measurement and post-excursion analysis of students' knowledge and understanding of road safety.

## **Background**

Road trauma is the leading cause of death for children in WA, and the second leading cause of hospitalisation for serious injury, and the state has one of the worst children's road safety records in the country. As an innovative strategy to address this issue, Constable Care Child Safety Foundation (CCCSF) has developed an experiential early-intervention centre designed to help children become more aware of their travel surroundings and other road users, and to assist them in developing safer transport-related behaviours.

Based on the best-practice early education principles of learning through play and simulation, CCCSF, the WA Department of Education and key community and corporate partners, have built and commenced operation of WA's only road Safety School, where children aged 4-11 years can practice road and public transport safety skills in a simulated urban environment that links WA classroom curriculum resources to practical skills training outcomes.

## **Method**

The 4,000 square metre \$1.7 million Safety School includes a classroom, railway station, train and bus models, fully functional road layout, including working traffic lights, rail crossing boom gates and pedestrian maze, pedestrian crossings, school zone, bus stop, roundabout, road signage and shared use path layouts. School groups of up to 60 students attend twice daily undertaking practical cycling education and augmented reality-enhanced pedestrian risk experiences.

Working with augmented reality design company DSBS, and the state's road safety curriculum resource developer SDERA, a tablet-based app was developed that allows children to select an avatar to represent them and then see the character involved in travel-related risk situations using the tablet camera at custom Wi-Fi enabled bollards located throughout the site.

The app was developed to provide a goal-focused reason for pedestrian movement around the centre, but then became a key teaching and learning vehicle in itself through the inclusion of interactive decision-making in relation to portrayed risks such as road crossing, school zone risks, bus stop and rail platform safety etc. A "gamification" approach was taken as a motivation strategy to reward students for correctly identifying risk. Two separate app experiences tailored to younger

(4 to 7 years) and older (8 to 11 years) children were developed, offering different risks appropriate for their stage of development.

Teachers can control the experience for their students, starting it and stopping it through a master app, seeing which students have successfully completed the learning exercises, and accessing additional context-specific road safety teaching notes to allow them to enhance the experience further for their class.

Visiting school groups are encouraged to complete tailored, relevant exercises in-class from the SDERA road safety learning resources before the excursion, and additional exercises after they return to school. This allows the Safety School excursion to actively promote and reinforce in-class road safety teaching and learning outcomes for participating schools. Pre and post measurement of student knowledge, attitude and intent to behave are collected from participating classes (opt-in) and the app also supports a back-end database which allows post-analysis of student learning patterns.

### **Results and Conclusions**

Data is not yet available to support the Safety School's effectiveness or otherwise as a teaching and reinforcement strategy for school road safety programs, as the centre has only recently commenced operation. Once 12 months of pre-post evaluation, app data, and student and teacher case study material has been collected, a full analysis will be undertaken to ascertain if a measurable benefit is occurring for students who participate.

From a systemic road safety promotion perspective, the Safety School's location on a major artery road near the Perth CBD, with 36,000+ passing vehicles per day able to clearly see the activity occurring onsite, makes it a visible symbol of road safety education in action for WA's most vulnerable road users.