Developing a Technology Based Driver Education Intervention: Theory and Practice

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Abstract

Driving simulators, and other new technologies, may be useful in increasing the effectiveness of traditional driver education and training programs as a safety countermeasure for young novice drivers. This paper looks at the process of working with industry partners to explore how new technology can be incorporated into an existing driver education program and test its efficacy in improving young novice driver safety. The Goals for Driver Education (GDE) theoretical framework underpinned the design and choice of intervention. Technology acceptance, practicality and efficiency were major considerations in the design process. A PC based, commentary drive intervention was selected.

Background

A driver education organisation approached the research team to integrate a driving simulator into an established novice driver course in order to extend the education currently provided. Funding was obtained from the Australian Research Council (LP140100409). The Goals for Driver Education (GDE), as the major theoretical framework used within driver education contexts, was selected as the theoretical framework to guide the identification and integration of technological innovations within the existing course.This theory identifies four hierarchial levels, ranging from driving-specific to abstract and general, and three domains of individualised knowledge, skills and awareness that should be taught (Hatakka, Keskinen, Gregersen, Glad, & Hernetkoski, 2002).

Intervention Development

A range of intervention options were considered, in relation to their efficacy for developing driving skills, cost, practicality for use with young novice drivers and accessibility for those in regional and remote areas. The most prominent considerations were how the intervention would be delivered, where and to whom. The prominent theoretical considerations were intervention content and effective delivery. A medium fidelity simulator was initially investigated. The stakeholders anticipated this type of simulator would meet their objectives. After consultation with simulator providers, driver educators, novice drivers and the literature, several potential challenges of this kind of simulator intervention were revealed.

The time available and manner in which participants could access the simulator placed major constraints on the type of intervention that could be successfully delivered to course students. Possible solutions regarding accessibility issues were identified. The simulator could be located at schools, at the driver education facility, or in other publically accessible facilities for use outside course attendance. Another option was to modify the existing course, to accommodate completing the intervention during course time. However, upon consultation with the organisation and other stakeholders (e.g. schools), none of the options were deemed suitable for the current study.

Guided by results of focus groups and surveys with novice drivers and driver education course educators (Rodwell et al., 2017), investigation was expanded to other empirically based, innovative technological interventions. The focus groups and surveys indicated that there was a need to consider more flexible and accessible modes of delivery. A PC based commentary drive exercise, to be

completed prior to course attendance, was selected as a theoretically sound intervention that was also practically appropriate for use in the field. The exercise involved viewing driving scenes while verbally noting potential hazards and had supporting research evidence (Wetton, Hill & Horswill, 2013). A number of factors influenced this decision:

1) Strong supporting evidence of hazard perception training in order to quickly and accurately identify a hazard as an effective intervention (Horswill, 2016).
2) Requiring an internet based program that enabled students to access training resources in their own time and thus negated the need to reduce course content at the driver education venue.
3) Addresses an identified decrement in young novice drivers knowledge and skills (Borowsky, Shinar, & Oron-Gilad, 2010) which is related to GDE level two: mastery of traffic situations or the ability to safely interact with other road users.
4) Using on-road footage (rather than simulated scenarios).
5) Reduced financial barriers (initial outlay and staff costs associated with monitoring a simulator unit).
6) Supported a key learning objective of the driver education course (improvement of hazard perception skills).

Next steps

Testing the effectiveness of the intervention will include a comparison of trained drivers before and after the intervention along with an untrained control group. Outcomes will include short-term psychosocial measures (hazard perception abilities, attitudes and willingness towards road safety) as well as behavioral indicators measured using longitudinal follow up licensing, crash and offence data.

References

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