

Mismatches between Trainee and Educator Perceptions Regarding the Use and Value of Driving Simulators

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Abstract

Driving simulation has become increasingly sophisticated. However, perceptions regarding the use and acceptability of simulators for driver education have received little research attention. An online survey with inexperienced drivers and focus groups with driver educators explored perceptions regarding the inclusion of driving simulators within novice driver education. There was a difference in the level of acceptance of simulators between groups with young drivers being highly accepting and driver educators displaying a high degree of scepticism regarding their efficacy as training tools. Moreover, education regarding the effective evidence-based use of simulators in training is warranted.

Background

Driving simulators have increased in technical sophistication and can be used to train a range of higher-order cognitive and procedural driving skills (Fisher, Rizzo, Caird, & Lee, 2011). Research suggests that simulators are, at present, more effective for training higher-order cognitive skills (Pollatsek, Vlakveld, Kappe, Pradhan, & Fisher, 2011). Little, if any, research has attended to perceptions about what driving simulators can or should be used for in driver education and their level of acceptance by young drivers and driver educators.

Method

This study consisted of an online survey of young drivers ($n = 100$; $M_{age} = 17.9$ years, $SD = .86$; female = 68%) and three focus groups with driver educators ($n = 10$) which involved a drawing task centered on driving simulators. The young drivers had completed a driver education course operated by an organisation in regional Queensland prior to participating. All driver educator participants were employed to facilitate this course. Young drivers provided Likert-type responses to a modified version of the Technology Acceptance Model (TAM; Davis, 1989) and free text short-answer responses to two questions asking about driving skills that could be 'better mastered' or 'mastered more quickly' in a simulator. Examples of driving skills were provided. Skills suggested by young drivers were categorized as procedural skills, higher-order cognitive skills, or a combination of both. The study was approved by the Queensland University of Technology Human Research Ethics Committee (1500001083) and funded by the Australian Research Council (LP140100409).

Results

Young drivers held a positive view of simulators with a mean TAM perceived usefulness score of 5.10 ($SD = 1.30$) and mean TAM perceived ease of use score of 5.19 ($SD = 1.18$) out of 7. A range of skills that could be trained in simulators were nominated by the young drivers (Table 1). Approximately, 62% of the total number of suggested skills that could be 'better mastered' or 'mastered more quickly' in a driving simulator were procedural skills. Comparatively, around 24% of the nominated skills were categorised as higher-order cognitive skills.

In contrast, the driver educators were highly ambivalent about the use of driving simulators. After discussion during the groups, there was general agreement amongst educators that, for both procedural and higher-order cognitive skills, only simulators with the highest level of fidelity could potentially be an effective training tool. However, the efficacy of even the most technologically advanced simulator continued to be strongly questioned by most participants throughout each focus group. It is possible that this scepticism is the result of a lack of knowledge about simulators and what can be effectively trained using them.

Table 1. Driving skills that young drivers perceive could be trained in a driving simulator

Category	Skill	Question and Frequency	
		<u>Driving knowledge – ‘better mastered’</u>	<u>Driving knowledge – ‘mastered more quickly’</u>
<u>Procedural skills</u>			
	Changing gears	50	64
	Vehicle manoeuvres	34	27
	Vision skills	22	21
	Lane position	20	21
	Road rules	12	-
	Braking	10	16
	Turning corners	10	14
	Checking blind spots	10	-
<u>Higher-order cognitive skills</u>			
	Practicing managing distraction	27	39
	Planning ahead	25	11
	Awareness and Observation	12	12
	Other Road Users	2	-
<u>Combined</u>			
	Driving under specific conditions	36	39

Note. Participants ($n = 100$) could nominate multiple answers and some chose not to make a response. Therefore, the total number of responses does not reflect the total number of participants in the study.

Conclusions

There is a mismatch between the high acceptance of simulators as a training tool by inexperienced drivers and the high level of scepticism towards them by the driver educators. There is disparity between the lay perception of driving simulators as predominantly useful for training procedural driving skills and research evidence suggesting greater efficacy for simulator training of higher-order cognitive skills. Promotion of evidence-based use of driving simulators in driver education is warranted.

References

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