From Research to Action: A Cognitive-Based Learning Program in the NSW Rural Fire Service

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Biography
Alex has been teaching and researching driver education since 1979. In1985 he was awarded a Churchill Fellowship to study in the United Kingdom, Germany, Japan and the United States. He taught at the Tasmania Police Academy for twelve years. In 1991 he became Chief Instructor for the New South Wales Traffic Education Centre. Since 1995 he has managed Driver Improvement Consultancy. The company designs management systems and produces resources that aim to improve driver behaviour. Alex is currently developing a web-based teaching and management system to influence the driving behaviour of personnel within seven Australian ambulance services.

Abstract
In the last three decades, we have seen much research into driver behaviour and subsequent attempts to explain and understand it. There have also been some attempts to apply this research, in the context of formalised learning experiences, to change driver behaviour. However, where such attempts have been made, there appears little or no evidence that these learning experiences have reduced participants' risk of crashing.

How is it that research has delivered us much knowledge yet we know so little? This paper considers some of the reasons and suggests the situation will remain the same for some time.

In the meantime, what can organisations do when they have a legal and moral obligation—and sound business reasons—to provide their personnel with information and training? One such organisation is the Rural Fire Service of NSW (RFS). Does it wait another three decades?

The education staff at RFS, together with Driver Improvement Consultancy (DIC), are collaborating to challenge the mainstream view that the time is not right to invest in learning programs to change driver behaviour. They argue that sufficient knowledge and expertise exists and that mostly a lack of clever thinking holds the learning agenda back.
DIC and RFS have used a simple validation exercise to illuminate potential gaps in conventional approaches to driver training and guided the designer's thinking towards new opportunities.

The course has now been designed and gone through several stages of trialing. It may broadly be described as a cognitive approach to influencing driver behaviour. The course delivers little information on how to driver safely. Its learning experiences help participants learn how to learn safer driving practices. The program draws on several areas of educational and road safety research. It's eclectic yet thematic.

Training and evaluation will start in the New Year.

1. INTRODUCTION

The research evidence suggests that driver training of a traditional and conventional nature contributes little to reductions in accident involvement or risk among drivers of all age and

experience groups. New approaches to driver training may eventually prove to be useful in reducing casualty accident risk/involvement, but much research and development work remains to be done (Christie, 2001, p. 35).

When the European Union Working Package 3 on Driver Training, Testing and Licensing was published in 1999 it cited several hundred research articles relating to its subject matter. Trimpop's encyclopaedic work *The Psychology of Risk Taking Behaviour* includes sixty-two pages of references. How much more research do we need before we can move forward?

Research is an invaluable tool, it helps us make informed judgements; but, as de Bono (1993) writes in his foreword to *Parallel Thinking*, 'analysis and judgement are not enough when there is a need to design a way forward'.

This paper does three things. It:
1. Asks why, in 2003, do we still not know how to influence driver behaviour using formalised learning experiences. It also suggests some reasons for our ignorance and considers what the future holds.
2. Proposes that by asking pedagogical questions, rather than traffic safety questions, we may be able to design a learning program that does at the very least, empower participants to become safer than they currently are.
3. Provides an example of a cognitive based learning program designed for the NSW Rural Fire Service.

2. WHY ARE WE STILL IGNORANT?

For over half a century, we have seen much research into driver behaviour and subsequent attempts to explain and understand it. Library shelves sag under the weight of accumulated knowledge and data. But we know little when it comes to changing driver behaviour through formalised learning experiences.

'Traffic safety is one of the many fields that can be characterised as data rich, understanding poor.… The Greek philosophers thought that nature could be understood by pure thought alone, without the need for data. Nowadays there seem to be people who think that it can be understood with data alone, without the need for thought' (Evans, 1991, p. 378).

After fifty years of research, we do not have so much as a valid and reliable specification for safe driving behaviour. In 1991 Henderson (p. 35) wrote, 'Much more work is required to determine more precisely just what safe driving entails'. Little has changed in the intervening twelve years. We still do not know with any certainty how to measure safe driving, teach it or test it. (Assuming such a thing exists.) Of the driving task, 'our current understanding is based on nothing more than the collective judgements of "experts" in the field, which is often no more that pooled ignorance' (Waller, 1983, p. 10).

How is it that research has delivered us much knowledge yet we know so little? Why do we have to ask, 'Can people be trained to drive or ride more safely and not to take unnecessary risks?' (Conference objective, ACRS, 2002)
Reasons for this predicament are many and complex. However, unless some attempt is made to confront them, the education agenda will remain stifled.

Some possible reasons follow.

3. SOME POSSIBLE REASONS FOR OUR IGNORANCE

Driver training and education research is trapped in an unproductive cycle. Driver training and education must be based on rigorous research; rigorous research is conducted on the

basis of cost effectiveness (and the probability of immediate economic, social and political benefit); research has shown that driver training and education has limited potential and needs more rigorous research; driver training and education must be based on rigorous research… and so on.

Rigorous research consumes vast resources. The De Kalb County study—the definitive evaluation of Driver Training in the United States—cost over US$4m and spanned over a decade (from concept to the last analysis). From this we learn driver training of a conventional nature is ineffective. It may equally be argued that research of a conventional nature is ineffective. We learned surprisingly little from the De Kalb study and worse, it plunged the silver dagger into the heart of those promoting pedagogical enquiry.

We may be assuming that those who research driver behaviour are the ones best suited, and perhaps best able, to see the pedagogical opportunities in their work and provide the necessary educational translation. There is little evidence that they are the ones best suited. Even if they were, rarely would they have the resources to further their work in an educational setting.

Researchers reside in a publish-or-perish world and they, like all of us, have political masters and personal needs. This environment exerts a complex range of influences over researchers' behaviour. These influences do little to accelerate our learning, they appear to condemn intuition despite it being able to lead to better understanding, offer no reward for creative excellence, and alienate nonconformists. (For an example, read Evans, 1991, pp. 299-300, on Wilde). Researchers wield power through the social positions they hold and the language that they have created and protect (see Smail, 1993). Whether intentional or not, people who may benefit from researchers' work are, in the main, unable to access this knowledge, test it in their own way, and share their interpretations of it.

Traffic safety (including driver performance and behaviour) is a chaotic and multi dimensional construct. It crosses many academic disciplines. Within each discipline exists much knowledge. We cannot rely on one discipline or the traditional '3 Es' road safety paradigm to find the solution (discussed in detail by Rothe, 2002). We lack a mechanism to extract, combine, and assimilate this knowledge to create new understandings. The RTA in the early 1990's, partly in response to STAYSAFE 18, made an attempt at this through its Driver Education Unit in New England, but the original vision does not seem to have been realised.

Researchers are attracted to problems. Novice driver safety, or lack of it, is perceived by the community to be a problem worthy of attention. Thus, researchers have become preoccupied with studying, in a very narrow way, 'the novice driver problem'. The guiding assumptions behind this work do not appear to have been well examined. There is little evidence of researchers' assumptions being examined in the literature.

To summarise, we have access to a gold mine, but our current thinking and institutional behaviour does not endow us with efficient and effective mining techniques.

4. WHAT OF THE FUTURE?

In 1995, the *Novice Driver Education Model Curriculum Outline* (AAA Foundation for Traffic Safety, 1995, p.23) spoke optimistically of a period of rapid development where the day's education programs would look primitive in five year's time. It appears such optimism was not well founded.
The driver education community still flounders in, what STAYSAFE 18 described in 1990 as, wishful and woolly thinking.

Christie (2001, p. 21) extrapolates from Lynam, 1995; Mayhew & Simpson, 1996; Gregerson, 1997; and Woolley that, 'From a theoretical perspective, there is support for the development and application of training that targets optimism bias, over-confidence and attitudinal/motivation factors that influence safe driving behaviour.

However, Christie (p. 22) goes on to say, 'one should be sceptical until the actual effect on crashes and violation is known. He concludes (p. 35), 'resources committed to post-basic driver education/training may actually act to undermine effective road safety programs by diverting scarce funds and community attention away from more effective initiatives likely to reduce crash risk.'

Despite two major studies in the 1970s demonstrating that driver error contributes to 95% of crashes and when only one factor is identified, it is overwhelmingly the road user (described by Evans, 1990, pp. 92-93), it's likely to be some time before we know how formalised learning experiences may contribute to improved driver behaviour.

In the meantime, what can organisations do when they have a legal and moral obligation—*and sound business reasons*—to provide their personnel with information and training? This is particularly the case with organisations that use motor vehicles as the main means for delivering services. One such organisation is the Rural Fire Service of NSW (RFS).

The population of approximately 68 000 RFS volunteers are, in the main, average drivers with average chances of crashing. Their exposure to risk is increased beyond that of an average driver as a consequence of their role. Their risk of being injured in a crash when including the time they drive outside the organisation is greater than the risk of being injured in a fire.

Does one say to these people that training is unlikely to reduce their risk and that it may actually increase it? Come back when we have done more research.

No, we should not discount possibility. As Evans (1991, p. 106) says, 'The absence of proven safety benefits from driver education does not prove that training cannot increase safety, but merely that none of the methods so far applied have been demonstrated to be successful.'

5. PEDAGOGICAL QUESTIONS MAY BE THE WAY FORWARD

The education staff at RFS, together with Driver Improvement Consultancy (DIC), are collaborating to challenge the mainstream view that we should wait for more research before investing in learning programs to change driver behaviour. They argue that sufficient knowledge and expertise exists and it's mostly a lack of clever thinking that holds the learning agenda back.

Teaching comprises content and process. Content includes the construct being taught, while process encompasses the range of experiences used to facilitate learning. If teaching does not achieve what it sets out to achieve then, it is reasonable to assume, there is a problem in one or both of these areas.

Based on this assumption, it would seem sensible to ask pedagogical questions about previous attempts to teach safe driving. (There appears little evidence of this being done.)
DIC and RFS used a simple pedagogical validation exercise to illuminate potential gaps in conventional approaches to driver training and to provide insight into new opportunities. The exercise probed the emotional, intellectual and psychomotor criteria and characteristics of the construct to be taught, how these may emerge when they come together to form a whole, and how they may best be taught.

Resulting from this exercise was a construct that draws heavily from causal attribution theory (see Martin, 1991), theory relating to optimism bias and personal calibration (see Gregerson, 1996, DeJoy 1989, Job 1990, Hamer 1990, Seligman 1992), Risk Motivation Theory (Trimpop, 1994), emotional intelligence (Goleman, 1996 and 1999), Human error (Reason, 1997), pervasive effects of external influences (Smail, 1993), cybernetics (Rothe 2002), and threat avoidance (RTA, 1997).

The construct proposes safe driving demands the use of feeling, thinking and acting habits that: minimise avoidable threats to safety (the driver's and other people's); and, compensate for the driver's errors (when he or she did not minimise the threat).

In this construct, exposure to risk is seen as being within the driver's physical control. The driver must know how to achieve this control and have the emotional and intellectual habits that generate control.

With the construct defined, DIC and RFS then had to design a learning program that had experiential validity. They faced many challenges.

How do we design formal learning experiences that can suit 68 000 people's varying needs? Can these experiences be effective despite the pervasive and covert influences of their social, cultural, political, and economic environment? Can we influence their behaviour when they spend little time in an organisational environment? Can learning experiences counter the negative consequences of habituation and regression to the norm? How do you train 68 000 people, using only lay facilitators? How do the facilitators succeed with participants who are only willing to turn up for about eight to ten hours, and who want to attend the course to learn about driving trucks and not their minds. And these are only some of the challenges!

One way to see through many of the above challenges is to question the assumption that *training can change behaviour*. If we believe, as many appear to, that training can change behaviour, we generate unrealistic expectations of what is possible in the few hours participants are at the training course.

If we assume the learning experiences that participants have *after* training are what change their behaviour, then the pedagogical focus must be on post-training learning experiences.

However, participants work and live independent of the organisation and, up to a certain point, driving is a self-guided activity. Thus students have to become independent learners. They have to develop their knowledge and understanding of driving, and emotional, intellectual and psychomotor habits, on their own. But how?

There is much evidence to suggest that critical thinking through the application of meta cognition can help people become their own teachers.
Vermunt (1995) proposes that independent learning behaviour *requires* that instruction should mainly be aimed at developing self-regulated control strategies and mental learning models, in which the construction and use of knowledge are central.

Bailey (2003, p. 130) suggests, 'Developing meta cognitive ability is considered a most promising area for finding improvement in driver training methods.'

'Fundamentally, critical thinking is just exercising the general forms of thought most conducive to sorting the true from the false' (van Gelder, 2001, p.1). For a simple but potentially powerful example, consider the question 'Is it true that I am an above average driver, or is this a false belief?'

Features of meta cognition and critical thinking include the ability to reflect upon and regulate one's thoughts, use executive control and process information strategically (Alexander and Murphy, 1994). Critical thinking and reflection assists in the development of expertise and enables us to correct distortions in our beliefs and errors in problem solving (Mezirow, 1990, p. 1). 'Critical reflection involves a critique of the presuppositions on which our beliefs have been built, helps people learn from the past but live in the present, with an eye to the future. Not to be critically reflective is to live in the present as a prisoner of the past' (Brookfield, 1993 p. 264).

This approach to self-directed learning is consistent with a modern curriculum that 'aims to help students ask appropriate questions and assist them to explore possible answers. Rather than providing answers to questions that someone else had decided were important' (Yaxley p. 7). Yaxley argues that, 'without effective engagement in intellectual interaction, the capacities of students to become self-directed learners will not be enhanced'.

Meta cognition and critically reflective thinking appears a salient theoretical construct; but how does one develop this skill in average drivers? To begin with, one does not call it meta cognition. The RFS program uses the metaphor of the personal coach. Students are trained to engage in dialogue with their coach—themselves.

The course is now going through several stages of trialing. It may broadly be described as a cognitive approach to influencing driver behaviour. It's eclectic yet thematic. The course delivers little information on how to drive safely. Its learning experiences help participants learn how to teach themselves safer driving practices.

The course designers are currently investigating an appropriate method for evaluation and funding possibilities. Training will start in the New Year.

The RFS proceeds not with blind optimism but confidence in the program's pedagogical theory. The organisation also believes that learning experiences are more likely to make personnel safer and less likely (indeed very unlikely) to increase their risk. If participants recognise they have been empowered to learn ways to become safer than they currently are, the course will have been successful.

6. CONCLUSION

Driver training and education still flounders in a world of wishful and woolly thinking. It does not appear to be effective in reducing participant's crash risk. Traffic safety research does not appear to be effective in helping us understand why this is the case. The traffic safety community may benefit from communicating more constructively and thinking more creatively. What or who will change the situation?
In the meantime, the NSW RFS and DIC have asked pedagogical questions to illuminate gaps in conventional approaches to training drivers. They have now designed an eclectic program that extracts new meaning from many related fields of existing research. A thematic cognitive-based program will be delivered and trailed in the new year.

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Keywords