

Summary of Changing mental models: How recent developments in teaching and learning can be applied to road safety education in schools

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Introduction

The country's dominant mental model accepts death and injury from road accidents as a fact of life. In this view, road deaths are inexplicable accidents, and not fully preventable. We need a mental model in which every crash has a cause to be eliminated in future – the way we think about air travel. This would lead us all to being ready, willing and able to take an active role in achieving a safe system of road use.

The potential and the challenges of school-based approaches

Educating young people shapes their mental models and habitual behaviours so they come to see themselves as active, responsible citizens. Quick solutions like one-off lessons, providing information alone or using scare tactics in relation to the death rate do not affect young people's long-term attitudes and behaviours (Raftery and Wundersitz, 2011; McKenna, 2010). School-based road safety education (RSE) intends to change the at-risk behaviours of young road users so they habitually use safe road behaviours in skilled and active ways. Another intended outcome is that young people collaborate in their communities to address safety issues.

Research findings on the effectiveness of different walking, cycling and driving RSE approaches

More effective

- Approaches based on best evidence about effective teaching and learning
- Content which is explicit, appropriate and challenging
- Focus on individual learning needs
- Targeting causes of risk behaviour
- Approaches that are evaluated

Less effective

- One-off approaches not linked to students' ongoing learning
- Activities that lack clear goals
- Teaching not evaluated for impact on students' learning
- One-size-fits-all approaches

Detrimental

- Programmes that promote early licensure
- Traditional training focused on vehicle emergency handling skills
- Use of scare tactics or confrontation without providing a parallel positive experience

Promising design and delivery approaches

Much has been written about "what" students need to know in relation to road safety; less established is a process for teaching this content using new understandings around "how" young people learn.

Recent learning theories (Alton-Lee, 2003, Hattie 2012) suggest that to change the mental models of young people, we need to consider four key features of our approach:

1. designing activities deliberately linked to how young people learn
2. ensuring relevance that motivates and engages young people
3. creating dissonance and developing deep knowledge
4. developing competencies for making decisions and taking action.

1. Designing approaches based on research findings about how young people learn

The following table summarises implications for RSE of the latest research on how young people learn (Alton-Lee, 2003; Hattie, 2012; National Road Safety Committee, 2008).

Clear outcomes

- Set and expect high standards for **all** students.
- Focus on what you want students to know and do after your teaching.
- Share what you want them to learn and why.
- Broaden your approach to provide a hook for every student.

Quality teaching

- Check what each student already knows and can do.
- Plan with any external providers to meet student learning needs.
- Build learning-focused relationships with students and provide a variety of ways to learn.
- Design units long enough for learners to: take in ideas; link these; look at ideas in a new way; and do something with them in real life to make a difference for others.

Home and community support

- Gather parents, students and communities to consider road safety behaviour and actions.
- Homework that encourages dialogue with caregivers.

Timely, useful feedback

- Help students answer: How am I going and what's my next step?
- Provide specific, responsive feedback on their learning as they're learning.

2. Ensuring relevance to motivate and engage

When a topic is relevant to students, they are motivated to engage in learning and to persist when it gets tough. Often it is not that students cannot learn; it is that they do not want to or cannot see the point.

The unit (Safe Soles) was such fun. All students were engaged in research about the hazards they had noticed coming to school. This helped them frame what safety issue they wanted to improve and what the focus for their artwork would be. – Art Teacher

NZTA's new approach to RSE curriculum resources is not prescriptive. NZTA resources encourage students, parents, schools and communities to think and act together to create new outcomes for safe road use. Students identify local community needs as contexts for producing knowledge, and work with others to change mental models around road safety knowledge, competencies, skills, attitudes and behaviours. From NZTA trials of Year 9 and 10 units in English, science, mathematics and the arts it appears that teaching road safety education this way provides more diverse, innovative and engaging ways to achieve both road safety and subject outcomes.

More kids understood force and motion because we linked it to road safety. They definitely understand it better than they would have if we had just put equations about forces on the board. – Science Teacher

Relevance emerges from students who are actively creating their futures and from their optimism and belief in their ability to shape the future.

3. Creating dissonance and developing students' deep knowledge

Supporting students to investigate issues in ways that create cognitive dissonance (conflict between what the student knows and what they believe) can help to change mental models and ultimately behaviour.

Students can rail at being told something – like lower your speed – but they cannot rail at asking questions and investigating data themselves, or at sharing conclusions and being asked to think about how we can improve on these statistics. Looking at data and considering what it means often leads to a change in knowledge, behaviour or attitudes because when kids discover things for themselves those things have more chance of sticking. – Maths Teacher

To be successful, school-based RSE needs to scaffold deep understanding. NZTA RSE resources do this using SOLO Taxonomy – a simple, reliable and robust model of learning. SOLO is used to identify prior knowledge, to differentiate learning experiences by explicitly linking, relating and extending student understanding and to provide feedback on learning through SOLO self-assessment rubrics – all approaches based on current research on how young people learn.

4. Developing students' competencies for decision making and action

Taken together, the key competencies support students to be ready, willing and able to use what they know. These competencies should be embedded in all approaches to school-based road safety education because young people need to:

- seek new ideas and examine their own and others' mental models (think, in key competency terms);
- recognise and manage their emotions (manage self),
- stand in others' shoes and demonstrate care and concern (relate to others); and
- work with others to design and implement solutions for the common good (participate and contribute).

Conclusions and recommendations

There is no checklist of approaches that will guarantee safer road behaviours. However, unless we re-think and evaluate existing approaches to RSE in the light of new approaches to learning, we risk wasting resources and time on "busy work" that simply reinforces the mental model of road deaths as accidents that are reducible but not preventable.

We need to work with young people who are at risk but are not looking for help.

Once effective emerging practice in changing mental models is identified, we need to analyse who is perceived as influential in creating changes in road safe teaching and learning, and then to use social media to describe and spread this practice.

References

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