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

Mary Chamberlain: Evaluation Associates and Pam Hook: Hook Education
Email for correspondence: mary.chamberlain16@gmail.com or Pam.Hook@gmail.com

Abstract

Most road safety education (RSE) programmes lack evidence that either their design or their impact is effective. While some delivery methods and resources may increase knowledge or skills, any such gains often fail to be translated into changes in attitudes and behaviour. Recent developments in learning theory are changing approaches to RSE in schools. NZ Transport Agency has used new knowledge about effective learning to inform the design of the delivery methods and resources of school-based RSE. This paper summarises the understandings about effective teaching and learning that underpin this promising approach. The key to the design lies in creating effective links among school, home and community and supporting educators to engage young people in thinking and acting together to create attitudinal and behaviour change. It also focuses on the importance of embedding resources in the day-to-day work of teachers in schools. Practical examples from New Zealand schools illustrate key design features.

Key words: Road safety education, mental model, learning theory, NZ Transport Agency.

1. Introduction

The way we currently use our roads leads to injuries and deaths that have huge costs to society, communities and the economy. Last year 284 people died on our roads and 2058 had serious injuries . New Zealanders who hold the country's dominant mental model accept these losses as a fact of life. In this view, road deaths are accidents that are inexplicable, unfortunate and reducible but not preventable. Left unchallenged, this mental model causes us to see what we have always seen: the same framing of the problem, the same responses, the same results.

Sweden has a Vision Zero road safety philosophy based on the view that "it can never be ethically acceptable that people are killed or seriously injured when moving within the road transport system" (Tingvall and Haworth, 2000). As a consequence, the Swedish mental model is that motor vehicle crashes are **not accidents** that lead to unexpected and unpreventable loss. Swedish actions and results show the power of this different framing of road death and injury.

To make a significant difference to safe travel in New Zealand, a change in our collective mental model is needed. New Zealanders need to develop a mental model in which every crash has a cause that can be understood and eliminated in future – possibly the same as the mental model we hold about air travel. The mental model we need will lead us all to being **ready, willing and able** to take an active role in helping achieve a safe system of road use.

2. The potential and the challenges of school-based approaches

Educating young people is about shaping their mental models and habitual behaviours so that as adults they come to see themselves as active, responsible citizens. Working in schools reaches a whole generation of New Zealanders. It is a unique means of nurturing sound road safety mental models and behaviours among future adults.

Young people also have the potential to disseminate new habits effectively among the rest of the population. An example is the way young people have influenced attitudes and behaviours of the wider population in favour of keeping New Zealand clean and recycling over the last two decades.

However, despite some success, achieving effective road safety outcomes through school-based approaches can be challenging. Constraints include an overcrowded curriculum, lack of time and resources, and lack of teacher interest and knowledge (Ministry of Transport, 2010). 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).

Road use is also a more complex activity than it might seem. Stradling and Kinnear (2007) provide an example by describing driving in terms that allow us to understand why simple interventions or pre-packaged initiatives fail to change outcomes in any meaningful way.

> *Driving is a skill-based, socially regulated, expressive activity involving balancing capability and task difficulty to avoid loss of control, along with real time negotiation with co-present transient others with whom the driver is presently sharing the public highway to avoid intersecting trajectories, while maintaining or enhancing the driver's mood and self-image.*

3. School-based road safety education

School-based road safety education (RSE) is education designed to create road users who are able and motivated to access and use information from their environment in ways that keep them and their peers, families and wider community safe from harm on our roads.

It is intended to change the at-risk behaviours of young road users so that they habitually use road safe behaviours in skilled and active ways. Another intended outcome is that young people will collaborate with other members of their communities to address any safety issues that arise.

Sitting behind RSE is the theory that improving the mental models that individuals and communities hold about road safety will change their road safety attitudes, thus changing their walking, cycling and driving behaviour and ultimately reducing rates of injury and/or deaths for road users.

3.1 How effective is road safety education in schools?

A range of school-based RSE approaches aim to improve the road safety behaviour of children and young people. These include:

- single focus, or one-off, interventions of limited duration;
- curriculum or cross-curriculum based approaches; and
- programmes that supplement education with other strategies such as enhancements to school crossings and other infrastructure near schools to support safer journeys.

Reviews of the RSE literature (Raftery and Wundersitz, 2011) indicate that there is a lack of evidence proving the effectiveness of most school-based road safety education. It also appears that many schools struggle to find time to schedule road safety education because they see it as involving "additional" and often boring activities.

> *When it comes to road safety material, most teachers would be likely to say, "Oh that's an interesting unit or activity but I can't fit it in…"*
>
> NZ Secondary Teacher

Despite the dearth of evidence on the effectiveness of particular programmes, some research findings have indicated which approaches to walking, cycling and driving RSE are likely to be more effective and which are less effective or detrimental (Alton-Lee, 2003; European Commission 2005; National Road Safety Committee, 2008; SUPREME, n.d.). These findings are summarised in Table 1.

Teachers and schools need support to make good decisions about teaching RSE. How road safety is taught involves a series of decisions about what outcomes to focus on and for how long, what resources to use and what teaching methods to employ. If RSE is embedded within a curriculum, it forms a natural part of the teaching and learning programmes in schools rather than being an "add on".

Table 1: Research findings on the effectiveness of different walking, cycling and driving RSE approaches

More effective	Less effective	Detrimental
Approaches based on best evidence about effective teaching and learning

Approaches where content is explicit, appropriate and challenging

A clear focus on individual students' learning needs

Targeting causal factors of risk behaviour

Approaches that are evaluated | One-off approaches that are not linked to students' ongoing teaching and learning programmes

Activities that lack clear goals

Teaching that is not evaluated for impact on students' learning

One-size-fits-all approaches | Programmes that promote early licensure

Traditional training programmes that focus on vehicle emergency handling skills

Use of scare tactics or confrontation without providing a parallel positive experience |

4. Promising design and delivery approaches

Much has been written about "what" students need to know in relation to road safety: the RSE literature has well-established content and contexts for road safety knowledge, skills, competencies, attitudes and behaviours. [1] However, less established is a process for teaching this content using our new understandings around "how" young people learn. Such a process would supply the connection between teaching something and ensuring that students are able to do something different as a result.

Given that the biggest influences on student learning include parents, teachers, peers and the wider community, the New Zealand Transport Authority (NZTA) uses "The Whole School Approach.[2]" In this approach, RSE resources are developed to support the school curriculum[3] (what and how children learn), school ethos and organisation[4] (how school things get done) and community partnerships[5]. They are hosted on the NZTA education portal[6] which is searchable at any time, from anywhere and by anyone.

In addition, recent learning theories (Alton-Lee, 2003, Hattie 2012) suggest that if we want to change the mental models of young people. We need to consider four key features of our approach:
1. designing activities that are deliberately linked to how young people learn**;**
2. ensuring relevance that motivates and engages young people;
3. creating dissonance and developing deep knowledge; and
4. developing competencies for making decisions and taking action.

---

[1] For example, the OECD GDE grid cited in Raftery and Wundersitz (2011, p 23) identifies goals, skills, risk aspects and self-assessment for life and living, driving, driving in traffic and driver control.

[2] "The Whole-School Approach" draws from a research project from the Western Australian state government's School Drug Education and Road Aware (SDERA): www.det.wa.edu.au/sdera/detcms/navigation/road-safety/getting-it-together. It identifies three contexts (school curriculum, ethos and organisation, and community partnerships) needed to change behaviours to create safe road use. The SDERA project developed a set of principles for best practice in school RSE that inform the NZTA Whole School Approach – see SDERA (2009).

[3] NZTA School Curriculum resources: http://education.nzta.govt.nz/resources/school-curriculum

[4] The ethos and organisation for road safety are obvious when road safety is "what we do around here". This outlook is achieved when school management actively promotes road safety education across teaching and learning activities, and school staff model appropriate road safety behaviour consistent with the school's road safety guidelines: http://education.nzta.govt.nz/resources/school-ethos-and-organisation

[5] Community partnerships directly influence students' transport and play environment. The NZTA online resources support processes for creating programmes that develop consistent messages and practices by all members of the school community. They include: setting up (and sustaining) a walking school bus programme with a local school community; developing safe school travel plans; and exploring safe pedestrian choices with the *Point of View* videos: http://education.nzta.govt.nz/resources/school-community-partnerships

[6] NZTA Education Portal: http://education.nzta.govt.nz/

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

As Table 2 summarises, the latest research on how young people learn provides useful insights to inform the design of effective teaching and learning approaches in RSE (Alton-Lee, 2003; Hattie, 2012; National Road Safety Committee, 2008). To ensure teachers will pick up and use the resources, we need a process for embedding RSE content and context within an existing curriculum. To provide a form of RSE that leads to deep learning that will change mental models, we need a process for:

- differentiating RSE content and context goals so they align with the prior knowledge the learner brings to the experience;
- relating and extending these content ideas and contexts for deep learning outcomes; and
- monitoring and evaluating the learning outcomes.

When we align an RSE approach with the research findings, learning outcomes are more likely to promote safe road use by individuals and communities in the long term.

Table 2: What research on how young people learn means for road safety educators

Research findings on learning	Implications for road safety educators
Clear outcomes Focus on high quality outcomes for **all** students. Share learning intentions and success criteria with students (if students are not clear about what they are supposed to be learning, they can expend effort on the wrong things and get disheartened). Make relevance transparent to students (often it's not that students can't learn, it's that they don't want to or can't see the point).	Set and expect high standards for **all** students. Focus on what you want students to know and do after your teaching. (This requires a fine balance: an activity that is too challenging will produce anxiety; if it is too easy it will produce boredom.) Share with students what you want them to learn and why it's important. Make your approach broad enough to provide a hook (something personally relevant and/or engaging) for every student.
Quality teaching Deliberately build on what each student knows and can do (it's easy to waste time going over things students already know and can do). Provide multiple opportunities to learn a **new** concept or skill. Opportunities to learn need to be effective and sufficient. (Most students need to engage with an idea several times before they understand it.) Provide opportunities for students to think about their mental model of safe road use. Provide opportunities for students to use what they learn in real-life situations.	Check what each student knows and can do before you begin. (Don't assume students know or don't know RSE content.) If external providers or experts are used, plan with them to meet student learning needs. Build learning-focused relationships with students and provide different approaches and opportunities to learn. (Different strategies will work for different students.) Design units that are long enough for learners to: take in ideas; link these ideas; look at these ideas in a new way; and do something with them in real life. Ask students to collaborate to solve a real-world task, and to apply what they have learnt to make a difference for others.
Home and community support Create effective links among school, home and	Gather parents, students and school communities together to consider road safety behaviour and

the wider community.	possible actions. Provide homework that encourages dialogue with parents/caregivers.
Timely, useful feedback Support students to evaluate their own learning. Give timely, formative, goal-oriented feedback to students.	Help students answer: How am I going? and What's my next step? Provide students with specific, responsive feedback on their learning as they're learning (not just at the end.

Of interest to the Road Safety and the Education Sector is the extent to which the RSE resources can be embedded within the New Zealand Curriculum (NZC) framework. In addition, is looking for a learning design that allows clear outcomes, has expectations for quality teaching, creates participatory processes (involving students, schools, families and/or communities) and provides timely, useful feedback (as in Table 2 above).

To start thinking **with** road users about the significant design elements in any RSE approach, the Road Safety and the Education Sector work together within a range of reference groups. Each group consists of representatives from classroom teachers, school leaders, various government agencies including health, education and police, regional councils and territorial authorities. Each one gives feedback on the learning design, ease of use and the potential of the proposed RSE initiatives and resources.

> *We were delighted to be involved in the planning stages since that gave us an opportunity to shape the content and form of the programme to ensure it is relevant to schools and their current curriculum obligations.*
>
> NZ Primary School Principal

In developing its feedback, these Road Safety and Education Sector reference groups consider the extent to which any proposed learning resource:
- **aligns with the Road Safety and the Education Sector's espoused values** for safe road use;
- **uses approaches based on research on how young people learn**;
- **identifies local and community needs** as the basis for producing knowledge and building competencies of value to road users;
- **uses participatory processes** to scaffold the co-creation of (new) knowledge and competencies of value to road users;
- **fits within the NZC framework**; and
- **creates public value in road use** through skilled and active participatory behaviours and actions.

This approach helps ensure each resource aligns to the learning areas and achievement outcomes in the NZC (including the key competencies and values) and uses the different learning areas in the curriculum to support **multiple ways of knowing** road safe behaviour and **multiple ways of interacting** with the different ideas.

4.2. 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 biggest challenge (in RSE) is finding authentic material that has been trialled and is engaging for most kids.*

Positive student engagement is not an easy term to define, yet we know it when we see it. According to Newmann (1986), students are engaged when they "devote substantial time and effort to a task…and they commit themselves because the work seems to have significance beyond its personal instrumental value" (p 242).

> *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

New Zealand schools are self-managing. They use the NZC to design a relevant school curriculum – one that meets the learning needs of their particular students. There is agreement about the goals that matter, but there is no prescribed curriculum content. Because of this flexibility, NZTA can choose timely, ongoing and developmentally appropriate road safety content and activities, which can be developed within a local context.

As a consequence, NZTA's new approach to RSE curriculum resources is not prescriptive; and it can enable participatory learning experiences aligned with authentic local needs – experiences that ensure relevance, engagement and motivation. NZTA RSE thus avoids being a deliverable – an approach that focuses on what people lack and then delivers it to them, which can frame people as "bundles of needs" rather than "bundles of capabilities and potentials" and miss opportunities for deep engagement and new outcomes, including new mental models (Leadbeater, 2009). Instead the NZTA approach becomes an activity that is done with others.

The learning design of NZTA resources encourages 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 then work with others to change mental models around road safety knowledge, competencies, skills, attitudes and behaviours. This approach is consistent with the NZC vision of young people as creative, energetic, enterprising; young people who actively participate in and contribute to the future well-being of New Zealand (Ministry of Education, 2007).

Road safety is a relevant and engaging context across all levels and in all learning areas of the NZC (for examples, see the Appendix). For instance, from NZTA trials of Year 9 and 10 units in English, science, mathematics and the Arts it appears that teaching road safety education in 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*

There are strong links among relevance, student engagement and achievement. If teachers see the relevance of RSE for student learning, they will be more likely to include it in their programmes. Similarly, if students see its relevance they are more likely to be engaged and motivated.

> *Feet First addresses so many important issues including respect for our environment, healthy living and child safety around schools, that we couldn't help but be involved in the programme.*
>
> *Primary School Principal*

Relevance does not come from telling; it emerges from students who are actively creating their futures and from their optimism and belief in their ability to shape the future.

Each student chose something specific they wanted to improve e.g. encouraging the use of pedestrian crossings where available or being alert to cars also using the school driveway.

Art Teacher

The story [Sione's First Walk to School, the winner of the NZTA's 2011 Feet First Picture Book Competition for primary students] targets a perceived need in the school community and by being bilingual it reaches the people who will get the most value from it.

Deputy Principal, Primary School

The NZTA recognises and acts on the significance of digital media and e-learning in young people's lives and in motivating and engaging students (Wright, 2010). For example, the NZTA RSE curriculum resources connect with students' digital lives by actively promoting the use of multimedia and social media such as blogs, wikis, Twitter and Google Maps. The NZTA Remix Competition[7] invites students in Years 9–13 to use digital media to produce safe road use resources that make a difference to others in their school community.

4.3. 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.

Telling students things does not work. It makes no difference to their behaviour. Road safety should not be taught by being preachy. 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 "constructive alignment" and Structure of Observed Learning Outcomes (SOLO) Taxonomy (Biggs and Collis, 1982), a simple, reliable and robust model of learning. Using SOLO in the learning design scaffolds for the deep conceptual understanding students need to make effective decisions based on road safety, and to participate and contribute with others in ways that make their whole community responsible for road safety. 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 of value based on current research on how young people learn.

This explicit model of deep and surface understanding has implications for the design of effective road safety education programmes.

The unit (We Travel Together) not only encouraged, but also demanded deep thought. Things that are deeply learnt are more likely to endure over time and lead to changed actions.

English Teacher

We developed an assessment rubric for the in-class investigation and included a self-assessment component to allow students to reflect on their own learning. Most students were not surprised about stopping distances, but they were surprised about the extent of the difference a small amount of extra speed can make.

---

[7] NZTA Remix Competition: http://education.nzta.govt.nz/competitions/the-nzta-remix-competition-safer-journeys-for-teens

4.4. Developing students' competencies for decision making and action
The key competencies needed for living, learning and working are outlined in the NZC. 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 in order to contribute to a safe road environment, young people need to be able 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).

For example, the NZTA secondary resources appeal to students' sense of community and belonging rather than using fear and shock tactics.

> *I learnt that everyone is responsible for keeping each other safe on the road and that crashes can happen to anyone.*
>
> Secondary Student

The English and drama resources[8] focus on building student competencies around their road safety decisions and actions that have consequences for friends and families, and for others we have never met. They encourage competencies for working with others and using prior knowledge to build a sense of community and belonging for safe road use.

5. Conclusions and recommendations

There is no quick fix for RSE; no checklist of approaches that will guarantee safer road behaviours. However, the new approaches to teaching and learning reveal an opportunity to make it more likely that the funding for RSE will be used in ways that make a significant difference to the mental models held by young people and their communities. Unless we re-think and evaluate existing approaches to RSE in the light of these 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 inexplicable, unfortunate and reducible but not preventable.

From reports of promising outcomes from differentiation in RSE, it appears we need to think beyond resourcing schools and students who are looking for RSE approaches and to work with young people who are at risk but are not looking for help. Other reports indicate the use of emerging digital technologies within and outside of vehicles deserves our attention.[9]

Once effective emerging practice in changing mental models is identified, we need to use "networks of influence" thinking to analyse which RSE actors are perceived as influential in creating changes in road safe teaching and learning and then to use social media like Twitter, blogging and Facebook to describe and spread this practice.

---

[8] http://education.nzta.govt.nz/resources/school-curriculum/road-safety/english-party-in-the-car
[9] For example, giving immediate visual feedback to adolescents and cumulative video feedback to parents and adolescents significantly increased the rate of safety-relevant driving events, enhancing adolescent driving safety (Carney et al, 2010). Using computer software training sessions to teach road crossing skills improved conceptual understandings and behaviour significantly (Dragutinovic and Twisk, 2006).

APPENDIX: NZTA RSE Case Study[10]

How far until it stops? Investigating stopping distances using a statistical enquiry cycle
Sarah Howell (Unit Writer) and Martin Vaughn (Teacher Trialler)
http://education.nzta.govt.nz/resources/school-curriculum/mathematics

When it comes to road safety material, most teachers would be likely to say, "Oh that's an interesting unit or activity but I can't fit it in." We wanted to design an approach that was core to teachers' work in mathematics but also led to valuable social outcomes like students having a deeper understanding about why the speed you travel is important, and being more aware of the behaviours needed to keep safe on roads. We chose to focus on the statistical inquiry cycle because it is required in the maths curriculum and it is also relatively new for teachers. We thought a resource that genuinely helps teachers to implement some new approaches required in the statistics curriculum would be welcome.

We were true to the statistical inquiry cycle in the maths curriculum and at the same time we addressed wider curriculum objectives about being safe on the roads and understanding where the issues are. We started with data that we wanted to investigate. We didn't start with a road safety message; we didn't tell them "the faster you go the bigger the mess".

An advertisement on TV or a lecture from teachers or parents is unlikely to make much difference to teenagers. We were looking for a teaching and learning process that was likely to spark a chain of thinking and action. If you contrive a context, kids will see through it. Contexts need to be relevant and real. We focused on the big idea of stopping distances. This included reaction distance – the time it takes for a driver to perceive that they need to stop and the amount of time it takes for them to react to the situation – and braking distance – vehicle reaction time and vehicle braking capability.

It was relevant and engaging for kids. They all travel. There was a hook for everyone. They could all see meaning. Some students were more interested in mechanical issues e.g. the brakes, the condition of the tyres and the effects of lowered suspension; some were more interested in how distractions like chattering influenced stopping speed; some were interested in the impact of weather and the construction of roads. Students carried out different investigations, then these fed into class discussions – so what each group knew and found out was shared, and we added our knowledge as teachers too.

We were surprised about how much the kids really thought about the context, and we were surprised at the depth of their insights. They came up with things we hadn't thought of. They knew the difference in the stopping abilities of older and newer model cars and cars with new and old tyres, for example. We looked at speeds in local suburbs and better understood why the speed in some areas had been lowered to 30km per hour. The kids made their own meaning about why we have 2-second and 4-second rules. We developed an assessment rubric for the in-class investigation and included a self-assessment component to allow students to reflect on their own learning. Most students were not surprised about stopping distances, but they were surprised about the extent of the difference a small amount of extra speed can make. We looked at the application of what they had learnt. We asked who would be interested in the results. Students suggested their parents, their peers who were learning to drive, and the local council.

Telling students things doesn't work. It makes no difference to their behaviour. Road safety shouldn't be taught by being preachy. Students can rail at being told something – like lower your speed – but they can't 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

---

[10] This case study highlights the outcomes from a NZTA RSE initiative where Year 9 and 10 students work with others to become skilled and active "producers" of road safety information in their local communities**.** See also case studies online http://education.nzta.govt.nz/;
http://nzcurriculum.tki.org.nz/Curriculum-stories/Case-studies/NZTA-case-studies

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.

Although we knew about stopping distances we are more conscious of the difference in stopping distance at 40 and 50km per hour now and it's made us more aware drivers. Now we are working on a maths unit that looks at angles and lapses in concentration. If you start veering at a small angle because of a distraction or concentration lapse, how long does it take to cross the centre line?

Through this unit of work we have added width to the informed decision-making our students are capable of. In the future it would be great to be able to access raw data from NZTA, data that is authentic and student friendly. Then our students could become true partners in analysing data, thoughtful problem solving and decision making, and making recommendations that might help create safer journeys for the wider community.

REFERENCES

Alton-Lee, A (2003) *Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis Iteration*. Wellington: Ministry of Education

Biggs, J and Collis, K (1982) *Evaluating the Quality of Learning: The SOLO Taxonomy*. New York: Academic Press

Carney, C, McGehee, D V, Lee, J D, Reyes, M L and Raby, M (2010) Using an event-triggered video intervention system to expand the supervised learning of newly licensed adolescent drivers. *American Journal of Public Health* 100(6), 1101–1106. Epub 15 Apr 2010

Dragutinovic N and Twisk D (2006) *The Effectiveness of Road Safety Education. A Literature Review*. Leidschendam, The Netherlands: SWOV Institute for Road Safety Research. Retrieved 15 April 2012 from http://www.swov.nl/rapport/R-2006-06.pdf

European Commission, Directorate General for Transport and Energy (2005) *Rose 25: Inventory and Compiling of a European Good Practice Guide on Road Safety Education Targeted at Young People*. Retrieved 17 April 2012 from http://ec.europa.eu/transport/rose25/documents/deliverables/booklet.pdf

Hattie, J (2012) *Visible Learning for Teachers: Maximizing Impact on Learning. Routledge 2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN*

Leadbeater, C (2009) *The Art of With. An original essay for Cornerhouse, Manchester.* Retrieved from 15 April 2012 from http://www.charlesleadbeater.net/home.aspx

McKenna, F (2010) *Education in Road Safety Are we getting it right?* RAC Foundation, UK. Report 10/113

Ministry of Education (2007) *The New Zealand Curriculum for English-medium Teaching and Learning in Years 1–13*. Wellington: Learning Media

Ministry of Transport Te Manatu Waka (2010) *Review of the Effectiveness of Road Safety Education for Young People in New Zealand.* Report by Cognition Education Limited.

National Road Safety Committee (2008) *Safer Young Drivers: A Guide to Best Practice Education*. Retrieved from http://www.nzta.govt.nz/resources/safer-young-drivers/index.html

Newmann, F (1986) Priorities for the future: Toward a common agenda. *Social Education 50*(4), 240–250.

Raftery, S J and Wundersitz, W L N (2011) *The Efficacy of Road Safety Education in Schools: A Review of Current Approaches*. CASR Report Series. CASR077. South Australia: Centre for Automotive Safety Research, University of Adelaide

SDERA (2009) *Principles for School Road Safety Education: A Research Summary*. Government of Western Australia, School Drug Education and Road Aware. Retrieved 6 June 2012 from http://www.det.wa.edu.au/sdera/detcms/navigation/category.jsp?categoryID=1861855

Stradling, S and Kinnear, N. (2007) *Young Drivers: A Fatal Attraction.* Paper presented to the Transport Research Institute, Napier University, Edinburgh. LARSOA North East Region 5th Annual North East Road Safety Conference, Durham, 8 November 2007

SUPREME (n.d.) Summary and Publication of Best Practices in Road Safety in EU Member States project. Retrieved 15 April 2012 from http://ec.europa.eu/transport/road_safety/pdf/projects/supreme.pdf

Tingvall C and Haworth, N. (2000) *Vision Zero: An ethical approach to safety and mobility.* Paper presented to the 6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000, Melbourne, 6–7 September 1999

Wright, N (2010) *e-Learning and implications for New Zealand Schools: A Literature Review*. Retrieved 10 April 2012 from http://www.educationcounts.govt.nz/publications/ict/e-learning-and-implications-for-new-zealand-schools-a-literature-review/executive-summary