

Nurturing citizenship: road safety as a rich context for learning

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Executive summary

The New Zealand Transport Agency has been a prominent innovator of approaches to education for school-age students in New Zealand. This report explains their approach and reports on three case studies that illustrate how it plays out in schools.

The Transport Agency's strongly articulated philosophy is that students should be educated in ways that build their dispositions to be responsible and proactive citizens who recognise their part in making the road commons safe for everyone. Working with a panel of innovative teachers and several key educational advisers, they have developed materials for schools that model a sophisticated weaving of higher level components of the New Zealand Curriculum (NZC), such as the key competencies, with learning area content. The overarching aim of the learning experiences they have designed is to develop and sustain awareness of road safety challenges, and to build students' dispositions to act to help keep the roads safe for everyone.

While the three cases documented in this report are only a snapshot of the many case studies that could potentially be completed, the successful outworking of this weaving vision is clear in all of them. The case study teachers had all built a new type of narrative about what learning is for – a narrative that values both traditional curriculum goals (building new knowledge and skills) *and* less familiar future-focused goals such as citizenship. They all worked to gain deep engagement, so that their students would be disposed to care about what was being learned and assessed. They also sought to support students to build their action competencies – the 'know how' and willingness to plan and carry through on ways to stay safe personally and to keep everyone else safe to the extent that this is possible for individuals to do. There is clear evidence that that all three teachers had these types of longer term goals in mind, and that they were willing and able to make space for their students to take greater agency for their learning.

There is also clear evidence that their learning experiences in 2016 were still vivid for the focus group students in 2017. Across their range of ages, all of them displayed an awareness of, and commitment to, attitudes and values of responsible citizenship with respect to their use of the road commons. All of them could articulate gains in knowledge and awareness and all of them reported enjoyment of the learning approaches used by their teachers (and that these differed from other type of learning encounters, including those in other, 'boring', road safety experiences).

These findings indicate that, where the intended approach is adopted with fidelity to the Transport Agency vision, the ensuing educational encounters are powerful and memorable for students and teachers alike.

1. Introduction

The New Zealand Transport Agency has been a prominent innovator of approaches to education for school-age students in New Zealand. This report explains their approach and reports on three case studies that illustrate how it plays out in schools.

The Transport Agency's education programme has a strongly articulated philosophy that students should be educated in ways that build their dispositions to be responsible and proactive citizens who recognise their part in making the road commons safe for everyone (Hook, 2014). The title of this report reflects that emphasis. Their work also draws on recent educational research about how best to support meaningful learning in school contexts (Chamberlain & Hook, 2012).

The approaches and materials the Transport Agency has developed are designed to respond proactively to opportunities presented in the New Zealand Curriculum (NZC). This is a framework upon which each school is expected to build a local curriculum by weaving together the various NZ components, within contexts that are meaningful for their student community (Ministry of Education, 2007). There has been a paucity of resources for teachers and schools that actually model powerful curriculum weaving as envisaged by the curriculum developers. The key competencies were one new component of NZC that proved to be particularly challenging to interpret and weave together with the more traditional curriculum components (Hipkins, 2012 summarizes these challenges). The Transport Agency's work with curriculum innovators has been informative for the more recent development of a "capabilities" approach to remixing aspects of the key competencies and curriculum content to create powerful learning experiences for students (see Hipkins, 2016). This remixing is further discussed in section 3.

The Transport Agency's education staff saw an opportunity to be proactive in response to the lack of resources that modelled innovative ways to weave rich learning programmes based on NZC. In 2011 they began to work with a panel of innovative teachers to develop resources that support implementation of NZC and at the same time model effective approaches to road safety education. Working collaboratively, the teachers on the panel developed an understanding of the Transport Agency's philosophy then began work on developing and trialling resources that model the rich curriculum weaving implied in NZC,¹ using various aspects of road safety as a context. The teachers' collective expertise enabled them to create units of learning that demonstrate ways to combine outcomes from different NZC learning areas with 'citizenship' outcomes related to heightened awareness of specific safety issues and challenges (across the suite of resources, seven of the eight NZC learning areas are exemplified).² These units of work, along with first-hand

¹ These resources can be accessed via the agency's education portal: <https://education.nzta.govt.nz/>

² The exception is the Learning Languages NZC learning area.

accounts of the experiences of the teacher panellists, have been widely publicised informally, with an emphasis on reaching out to teachers to invite them to use the resources provided.

Further support has come from professional learning events organised by employees of regional agencies, for example transport coordinators or road safety officers employed by local or regional councils. These day-long workshops explain the Transport Agency's philosophy, and expand on the curriculum weaving model (for example by exploring more innovative components of NZC such as the key competencies), and provide opportunities for other teachers to talk directly to some panel members about their curriculum thinking and practical implementation experiences.

Since 2010 annual competitions have provided an opportunity for school students to practice and develop capabilities in critical and creative thinking for citizenship when using the roads. In 2016 (the year pertaining to the case studies in this report) the competition took the form of designing a game to raise awareness about some aspect of road safety. In 2017 the competition has a focus on future transport. The website invites students to "think like citizens of the future, today. Investigate challenges and opportunities. Imagine solutions and question systems. Share your ideas for the future of transport".³ The general principle is that the competition will provide an opportunity for students to do something creative and cutting-edge while also learning a great deal about the specific aspect of transport on which they focus. Each competition has been framed in ways that enable the road safety component to be woven into any learning area, or combination of learning areas, the teacher or school chooses.

The research approach and questions

This project involved completion of three exploratory case studies. The schools and teachers who took part were nominated by the Transport Agency. They were chosen as known innovators who had designed and implemented effective approaches to road safety education in their school contexts. All the teachers were members of the Transport Agency's innovation panel and all of them had supported students to take part in the 2016 game design competition, with varying degrees of success. The Transport Agency asked NZCER to undertake research on what these teachers have done, and how they have created then used the resources.

The nominated teachers were approached separately by NZCER to obtain informed consent. The research aimed to find out what other teachers – and the Transport Agency itself – might learn from the experiences of these trail blazers. Four broad sets of questions informed the study:

1. What sort of learning goals do teachers have in mind when drawing on road safety as a context? What specific types of capabilities do they aim to foster and why? How do they link these to the curriculum (both at the high level and in specific learning areas)?

³ <https://education.nzta.govt.nz/competition>

2. How do teachers design and enact a curriculum that meets these goals? How are their capability goals reflected in the learning experiences that teachers design? What sorts of pedagogical considerations impact on the learning action as envisaged and as it unfolds? When and how do they capture evidence of learning?
3. What are the affordances of road safety as an ‘authentic’ context for learning? (How) does the road safety context support the NZC big-picture vision? Potential areas of interest include the future-focus principle, citizenship purposes signalled in several learning area statements; systems thinking capabilities; sustainability education; building action competencies, fostering collaborative inquiry and so on.
4. How do learning experiences related to road safety impact on students in the classes of these teachers? What do students recall as memorable and why? What is their sense of the purpose(s) and important insights from the learning experiences? What futures do they envisage for themselves and others in relation to safe use of the road commons? Do they have unmet needs or further questions/ areas of interest they would like to explore? Do they have reservations about the learning and if so what and why?

The first three sets of questions were discussed in an interview with the nominated teacher in each school. These interviews took around an hour and in two cases were accompanied by a tour of the school. The teachers also shared examples of student work that supported the conversation.

In two of the three schools a focus group was convened with students who had taken part in the learning experiences discussed with their teacher. The teacher organised informed consent from parents and the students, but was not present during the focus group conversation. The students discussed the fourth group of questions in conversations weighted towards the actual recall of experiences. Both focus groups were larger than requested or anticipated. This made it difficult to deeply probe the final questions in the set while still giving each student a fair chance to have their say. It was not possible to convene a focus group in the third case because the teacher had shifted to a different school in a new leadership role.

Knowledge about what is specifically challenging when educating young people to learn about and act on road safety messages provided the starting point for the final phase of analysis. Implications arising from these known challenges were teased out and used to frame common practices that emerged from the three cases. The potential contribution of these highlighted practices to effective road safety education more generally is elaborated within the wider context of recent research on curriculum key competencies/capabilities, given their central but contested role in weaving a meaningful curriculum based on the NZC framework.

The structure of the report

The next section of the report describes each case as a whole. These cases have been shaped from the interview data. Each case presents a holistic overview of the teachers’ curriculum thinking and pedagogy in the context of their role in their school. This overview is framed by the overarching

research questions. These individual cases were returned to the teachers and minor amendments made as requested. Comments made by students in the two focus groups are presented anonymously and woven through each case at relevant points. Care was taken to shape their comments in ways that would not allow them to be identified.

Section 3 then explores issues and opportunities evident in all three case studies, with an emphasis on both challenges and rewards of road safety education. Finally, Section 4 draws the threads together to discuss road safety education in the wider context of educating students to be good citizens and responsible users of the road commons both now and in the years beyond school.

2. The case studies

This section presents the three case studies. Note that verbatim comments from either the teacher or from students are in italics. Student and teacher comments are woven through the narrative flow of each story rather than being presented in separate sections.

Case 1: Walking the talk of curriculum change

Rather than just being the guy with the ideas I had to do them, make them visible.

Until recently Hayden Shaw was a member of the senior leadership team at Heretaunga College in Upper Hutt. He is now a senior leader at Rolleston College just outside Christchurch. The teachers at Heretaunga had been exploring curriculum changes in the senior secondary school and Hayden was keen to see these changes extended down into the junior years as well. Specifically, he was keen to encourage greater curriculum integration. He knew his suggestions would be more convincing if he could show the way by trying out innovative ideas himself.

In the role of form teacher, Hayden quickly got to know his year nine class very well. He taught PE to this class but also spent one 45-minute period with them each week when he could explore ideas such as *developing a growth mind set* or revisit ways in which students were *developing their key competencies as part of their learning*. He invited other teachers of this class to consider collaborating on an integrated unit of learning. Their technology teacher took up the challenge and so the innovation outlined in this case study was born. They opted for safe cycling as a context in which students could develop a response to the Transport Agency's 2016 game competition.

Several factors influenced the decision to focus on cycling. Hayden was aware that the *drop off culture* of being delivered to school by car meant that fewer students were cycling to school than in the past. He cited national statistics showing that the proportion of students cycling to school had dropped from 19% to 3% over the last 25 years.⁴ One obvious link between this change and the Health and Physical Education (H/PE) learning area of the curriculum is the missed opportunity for being more active during the school day and the many health benefits that cycling confers. Designing and developing a road safety game provided the technology learning area aspect of the integrated unit.

Hayden also had another pressing concern. At age 13–14, year 9 students are getting close to the time when they will want to learn to drive. Hayden was very concerned that their main exposure

⁴ See <http://www.transport.govt.nz/assets/Uploads/Research/Documents/25yrs-of-Travel-Summary.pdf>

to interactions on the road was as pedestrians or as passengers in cars. On a bike, the rider makes decisions that immediately impact other road users as well as their own safety. Similarly, the things that drivers do can impact on cyclists in ways that pedestrians will not necessarily experience. For cyclists, the potential for learning to be a responsible user of the road commons is high. Hayden saw this learning as critical preparation for becoming an aware and responsible driver.

Fortuitously the school had a set of mountain bikes that were being underutilised and so the plan for the active biking unit began to take shape. In addition to the 12 school bikes, Hayden brought his bike and so did several students. With safety issues paramount, the learning began in the school grounds. Students collaborated to devise challenging riding circuits as the physical activity aspect of PE. Hayden noted that this design experience was also good preparation for the game design to come. The actual riding that students did at this time also ensured that they had the skills and coordination needed to be safe on the road. Some students had to learn to ride and were supported by others as they built these skills. Hayden noted that the students were very engaged and positive about biking. They loved the *physical activity and fun*.

The road safety component initially came to the fore as students observed cyclist and driver behaviours on roads near the school, identifying hazards and possible actions in response to these. This part of the learning reflects the fourth strand of the H/PE curriculum, which has a focus on taking action in situations that impact community health and wellbeing. The different PE curriculum strands came together when students got out onto the roads to ride specific circuits they had agreed. The most confident cyclists did the riding, with Go Pro cameras strapped to helmets, behind their backs, or on the handlebars. Hayden noted that the footage generated attracted intense interest when it was reviewed in class. *They loved that*. He described this as the *empathy stage* of the overall unit because students were able to explore safety issues and challenges from the different perspectives of cyclists and drivers. Processing these learning experiences provided vivid input for students as they thought about the focus and design of their road safety games.

While students were undertaking the biking part of the unit in PE they were also learning about design processes in technology. These two different experiences came together when the actual game design became the learning focus. Hayden noted that coordination between the teachers was important so that the two subjects merged well, and continued to be important as students used both PE and technology time to complete their games. He also said that the open nature of the design challenge was important: *students could own what they did*. Some groups really surprised themselves with what they achieved. However, for various reasons, only some groups succeeded in delivering a game that could be submitted to the competition. One group won a spot prize for participation and this was very motivating for the class.

This unit was completed early in the school year and contributed to Hayden getting to know his form class very well, very quickly. In Week 7 of the term he held learning conferences with each student and their parents or caregivers, at which the learning in the unit was discussed. He noted

that it was *great to hear from the kids about what they were enjoying* and these conversations gave him a good sense of next learning needs in PE. There was no formal assessment as such but between them the two teachers did assign each student a report grade for their participation in the game design process. When asked if lack of formal assessment created challenges, Hayden noted that this was a pilot class so *parents and other teachers expected some things to be different*.

Case 2: Balancing the road safety message with other curriculum goals

At the time of our conversation, John Denton was HOD art at Samuel Marsden Collegiate, a private girls' school. In 2015 he attended a day-long work shop run by the Transport Agency in Wellington. The day aimed to broadly introduce secondary teachers to the challenges of effective road safety education, to scope potential links to specific aspects of the curriculum such as the key competencies, and to model the possibility that every curriculum area could potentially use road safety as a powerful context for learning. The workshop had an emphasis on being a good citizen by making responsible use of the road commons. This citizenship emphasis struck John as a powerful *aha moment*. He was already interested in the road safety game competition, which the Transport Agency was promoting at the time, and now saw the potential to link the theme of *acceptable behaviour as a participant in a community* to a pre-existing unit of art with a focus on cultural identity.

The unit John had in mind was designed to take students on an art-based exploration of their cultural identity as New Zealanders. Although the students were only in Year 8, the unit had an explicit focus on aspects of semiotics such as the role of icons as signifiers of identity. Previous iterations of this unit had explored students' sense of cultural identity in the context of a Māori legend. John figured that using road safety instead would keep the *sense of place* while supporting students to tell a different type of narrative story about who they were as young New Zealanders. With hindsight he came to see that this was a very ambitious agenda. Some students made the connection between the art conceptualisation and the contextual learning about responsible road-related citizenship, but others expressed the identity element rather superficially. For example, one common response was to add decorative cultural motifs around the edges of the games they designed. Indeed some of the interviewed students described this cultural overlay as a requirement imposed by the sponsors of the competition, rather than a specific curriculum aim envisaged and supported by their teacher.

This was John's first attempt at meeting such an ambitious agenda. Reflecting on what had transpired John discussed tensions between *thinking and making*. Some students did too much of one, some too much of the other. With hindsight he would adjust the balance from 50/50 (thinking/making) to 70/30. For many students, the main learning proved to be game design rather than new insights about cultural identity. Keeping to the usual time frame for the overall unit (10

weeks in total) did not help. His sense was that if he could have stretched the time out, he would have been able to achieve all the envisaged learning goals.

Notwithstanding the challenges John described, it was clear from the conversation with the students that they had been prompted to deeply engage with road safety challenges. Asked what they thought were the key intended messages from the unit, students said:

Be very aware of children, especially around schools.

Keep your eyes on the road.

Be very aware of what's around you and respect the rules.

Driving and walking are a privilege. We should respect the rules if we don't want that privilege taken away.

Pay attention to signs and what they mean.

This last idea clearly linked to the intended learning about semiotics. It prompted a small flurry of conversation in the group and was clearly an aspect of the learning that intrigued them. From comments made around the group, it seemed that heightened awareness of the meaning conveyed by less familiar road signs such as *the speed bump hat* had been applied when they were out and about on the roads. The students also described heightened awareness of their responsibilities as passengers. One student said she would now *put myself in the driver's perspective* and be more respectful of their responsibilities and challenges.

All the students reported great enjoyment of the unit and the manner in which they came to learn about road safety. They were pleased that it was *not just based on something bad [happening] or boring* learning based on messages they had heard *over and over again*. One student described the experience *as trick learning* because *you were learning a lot but you didn't realise*. All of them appreciated the elements of choice and fun in the design process, with some saying this was the first time they had really enjoyed art as a subject. Interestingly, with the possible exception of health, students did not think that they could have learned about road safety as effectively in any other curriculum area.

Looking back, John could see that the students had gained a heightened understanding of consequences for specific actions, particularly because such consequences tend to drive the unfolding action in a game: *If..., then...* Both he and the other art teacher (who joined us part-way through the interview) spoke about the strong fit between the citizenship emphasis on *doing the right thing* and the ethos of *giving back to the community* that pervades this Anglican school. Several of the students also wondered how they could effectively help others learn what they had learned. Another retrospective reflection concerned a missed opportunity when the students trialled their prototype games during a lunch time session, when any students could come and play. The games sparked really good conversations and were obviously highly engaging but no specific feedback was captured. John said he would definitely do this if he ran another similar unit.

Taking the learning from this first foray into the road safety context, John has since designed a digital technology unit for Year 9 students called Back Seat Driver. The emphasis is on students' own rights as passengers, and how they might communicate their concerns to those in the driving seat. This could be especially tricky when the driver is their parent – for example if they didn't put on their seat belt before driving, how could they be reminded without unleashing a counter-productive response? This is precisely the challenge of any effective road safety communication so the students were learning much more than the effective poster design that was the ostensible outcome of the unit. Again this unit proved to be highly engaging. John noted that it prompted students to take more notice of their own rights in cars, and how to find their own voice. (Students who took part in this unit were not interviewed.)

Case 3: Travel safety as a whole-school ethos

Newmarket Primary School is located in a very busy urban area. A major road right outside the school gates feeds traffic onto and off Auckland's North-South motorway system. Double yellow lines along the road verge severely limit car-parking near the school. A comparatively new electrified rail network is close by; Auckland does not have an established history of using rail as a commuter transport system. The school is squeezed on all sides, surrounded by a mix of commercial properties, medium-rise apartments, and stand-alone homes. A new multi-story block is in development to ease space constraints in this busy primary school. This setting is integral to the story of Newmarket's embedded approach to educating children to be safe on and around the road and rail transport networks close to the school. Safety is not a one-off topic here, but rather a living presence in the children's lives. The school's philosophy emphasises that the children are already citizens who can act for their own and other's safety and welfare. They are given multiple opportunities to learn how to build their citizenship capabilities, including in the context of safe journeys to and from school.

Deputy principal Virginia Kung⁵ explained the many ways in which this vision plays out in the daily life of the school. Supported by Virginia and another teacher, a Travelwise⁶ group of mainly older students meet weekly. Their aim is to keep challenges for safe travel in the forefront of attention – for parents and others in the surrounding community as well as staff and other students. Student members of this group enthusiastically recounted some of their recent successes:

- The group help organise one-off events that profile specific travel challenges. They were in the process of designing an event for Road Safety Week at the time of my visit, with a focus on safe cycling practices.
- Where they see specific hazards that can be addressed, the group find ways to do so. Many students ride scooters to school. After several nasty episodes of children falling while

⁵ Virginia was acting principal at the time of the interview while the principal Dr. Wendy Kofoed was on sabbatical leave.

⁶ Travelwise is the name given to an Auckland Transport initiative. In this school, resources from both Travelwise and the Transport Agency are used in highly effective combinations.

scootering, the Travelwise group decided to campaign for those using scooters to wear bike helmets. With the help of a parent, they sourced high quality helmets for a very reasonable price. They approached the Auckland Council for sponsorship and sold the helmets for a fraction of their retail cost. To their evident delight, all 40 helmets were snapped up within a few days and children in the school are now wearing them when riding their scooters to and from school.

- Cars, buses and trucks all often travel too fast on the motorway feeder road outside the school. The Travelwise group have organised several high-visibility ‘demonstrations’, waving placards outside the school gate before or after school to remind passing motorists of their responsibilities to the children entering or leaving the grounds at those times.
- A Back to School campaign included members of the group making videos of unsafe parking as children were dropped off or collected from school. These were shown in assembly.
- Both the Travelwise group and the teachers encourage students to walk or scooter to school and they lead by example. A Milo Day encouraged students to walk to school. Those who walked at least 400m were rewarded with a cup of Milo, made for them by members of the Travelwise group.
- Last year students entered a poster competition run by Auckland Transport. Those efforts won them the loan of a set of Big Foot mountain bikes for a day. The Travelwise group set up a course at school and classes took turns. It was a first opportunity for some students to actually ride a bike. Even for those who could do so, it could be challenging that the bikes had *lots of gears*. Members of the Travelwise group were on hand to help students who needed support during this high-profile event.

Virginia noted that last year’s oldest Travelwise members (who are no longer at the school) would have expressed great pride in the school’s Gold Award from Auckland Transport, which marked their *outstanding achievements in 2016*.⁷

Recently the Travelwise group raised money to purchase their own speed gun. The police officer who supports the school had shown them how to log the speed of passing traffic. With teacher support they decided to purchase their own equipment. This has meant that more systematic inquiries can be integrated into curriculum learning, specifically as part of statistical inquiries. Accumulated data is also reported to Auckland Transport. The students’ own efforts can then be reinforced by adults who are in a position to make a difference. Police periodically undertake more regular traffic speed monitoring near the school when children are arriving or leaving, and parking wardens regularly patrol to watch for parking on the yellow lines as parents pick up or drop off children, which obscures other motorists’ vision of the children and creates a high risk of accidents. In a related curriculum initiative, one student from the Travelwise group had recently completed a science investigation into *Newmarket’s busiest traffic*.

⁷ <https://at.govt.nz/cycling-walking/school-travel/travelwise-schools/travelwise-awards-and-events/>

In the summer, groups routinely walk to and from swimming at a nearby pool. The school's liaison constable emphasises safe walking practices in his work with the youngest children (they walk around the nearby streets and actively explore the hazards). He also reminds older students of these practices when he is working with them. These messages clearly stick – the younger children in the group I interviewed volunteered that they should: *cross at the crossing; hold the hand of an older person; and watch for cars that don't stop.*

Virginia explained several important school-wide professional learning initiatives that have contributed to teachers' high uptake of embedded road safety learning. A systems-thinking focus on safe travel was initially developed for the Transport Agency by education consultant Pam Hook, who encouraged the school to take this approach and supported them to design appropriate assessment using the SOLO taxonomy (see next section). In 2016 these experiences evolved into a curriculum-wide emphasis on learning about all sorts of different systems and how they work. Virginia said this focus was highly engaging and opened up multiple potential learning pathways, with the bonus of a strong future focus and many opportunities for students to show agency in their learning. She noted that *our teachers loved it* and it is *so easy to link new learning to what has been previously learned*. This uptake and support from teachers is critical because they have a lot of agency over their classroom learning programme. They choose for themselves when and how to embed road safety learning and would not do so if they did not see it as important.

The second important professional learning initiative was supported by the Springboard Trust. This group *assists principals and their lead teams to enhance student achievement by strengthening strategic in-school leadership capability*.⁸ Virginia worked with a mentor from the Trust to work on ways to more actively engage the school community in the development of their learning plan. She noted synergies between this experience and the systems thinking curriculum developments: *it [the plan] is a system in itself*. This realisation sits at the heart of collaborative curriculum planning, with students, teachers, parents and school trustees all involved. It also motivates the efforts of the school's leaders to communicate clearly with their community – *to be transparent about everything we do*. Students write blogs of their learning experiences, which is yet another way of reaching parents with important road safety messages. And the Travelwise group report their activities to the school's Board of Trustees each term.

Towards the end of our conversation we circled back to the theme of citizenship and the importance of making space for students to develop their citizenship capabilities, which are signalled as important by the New Zealand Curriculum. Virginia noted opportunities such as Travelwise can open up spaces where students demonstrate leadership that might not have been visible in day-to-day learning. She cited the example of a student who developed a circuit where students stopped to answer safety questions embedded in QR codes (patterns designed to be scanned by mobile devices, which turn the code into specific images and/or text). As she brought her game vision to fruition, this student had struggled with managing the complexity of her

⁸ <http://www.springboardtrust.org.nz/>

design. She needed to delegate a lot of tasks, which meant she needed to persuade those with the necessary expertise to help her. Looking back, the teachers could see that *she nailed it* and the student also saw that she had learned a valuable life lesson: *Now I know I can use other people, I'll do it again*. This example caused Virginia to reflect that the school is *going from strength to strength in what we are seeing from kids now*.

This case study illustrates how multiple community initiatives can be woven together when a whole school commitment is made to safe travel practices. The curriculum materials and pedagogical approaches (e.g. taking a systems approach, weaving road safety learning with curriculum content, including via the Transport Agency competitions) are supported by the Transport Agency materials and initiatives. The special events are supported by Auckland Transport and the community outreach has benefitted from the leadership support of the Springboard Trust. All these inputs interact in complex ways, such that the whole is more than the sum of the parts. Road safety is not the only context in which this school's vision plays out, but it is an important and powerful one – and a living, vivid presence in the school.

3. Why road safety education is both challenging and rewarding

This section explores common themes across the three case studies. Knowledge about what is specifically challenging when educating young people to learn about and act on road safety messages provided the starting point for the analysis.

Existing research is clear about what does work and what doesn't work in road safety education (NZ Transport Agency, n.d). Key research-based messages from this paper are summarised in the first column of the table below. The second column aligns these messages with implications for enacting effective road safety education in schools. How these implications actually played out in the three case studies is then elaborated.

Table 1 **Messages about effective road safety education and their implications**

Research-based messages	Implications and challenges for effective road safety education
'One off' events, including those led by external providers, are not effective. They do not lead to lasting outcomes	Anything more than a 'one off' implies a need for meaningful <i>curriculum integration</i> because the overall curriculum is already so crowded
Research has shown that interactive learning is 2–4 times more effective than non-interactive learning	Students need learning opportunities to that support them to <i>actively build</i> their knowledge, skills and dispositions to be safe users of the road commons
Students need to take agency over their learning and actively build their social competencies to act in safe ways	Again this implies interactivity, with the added dimension of making space for students to <i>take initiative</i> , to explore real life challenges pertinent to them, and to <i>design and practice solutions to problems that they 'own'</i>
Road safety education needs to be revisited multiple times over the course of a school learning career	Comments from focus group students raised the possibility of boredom – the sense of hearing the same message “over and over again”. The challenge is to develop <i>new and compelling learning angles and interactive learning opportunities</i> so that reinforcement is more subtle.
A whole-school approach conveys the clear message that road safety is everyone's responsibility	This implies the development of <i>school ethos that values and makes possible safe practises</i> , and that reaches out and <i>involves the wider school community</i> in these practices where possible

Meaningful curriculum integration

Table 1 implies that road safety education will be more effective and sustainable when integrated into the overall curriculum. Meaningful integration allows time pressures to be better managed while also providing opportunities for creative teachers to find new ‘angles’ for keeping road safety learning fresh and engaging.

The first two sets of research questions were designed to elucidate the curriculum thinking that underpinned the three cases. Even though they taught different subjects and/or students of different ages, the three teachers had a number of things in common when it came to talking about implementing the New Zealand Curriculum.

Any curriculum learning area can provide opportunities to use road safety education as a learning context

In each case the teachers said that road safety provides a *compelling context* in which to develop traditional learning outcomes alongside important road safety outcomes. As the brief recap of their ideas demonstrates, each unit developed different road safety outcomes as well as different traditional outcomes.

Virginia, who teaches at the primary level, noted that there could be opportunities right across the curriculum. She specifically mentioned opportunities to conduct a whole statistical inquiry, based around gathering, processing and reporting on traffic flows outside the school. Such inquiries are an important component of learning in the Mathematics and Statistics learning area of NZC. Beyond the traditional learning about the statistical inquiry cycle, students were also being given opportunities to develop aspects of their capabilities for engaged and responsible citizenship. By being systematic in the gathering and processing of their data, students learned how to provide actionable information to Auckland Transport. The power of this type of information-gathering and analysis became obvious to the students when their data was seen to be acted upon.

As secondary teachers, both Hayden and John were understandably focused on curriculum areas where they had specific expertise. John created a rich unit of learning by melding semiotics – a theoretical area of visual arts – with the 2016 road safety game design completion. While he felt this was only partially successful, the interviewed students demonstrated an acute awareness of the role that signs and symbols play in safe road usage. Another unit John subsequently developed wove aspects of design technology and road safety learning. Here the road safety outcome was different again. Effective communication of road safety messages is known to be challenging (Guttman, 2015) and students in this class experienced some of those communication challenges at first hand.

Hayden’s bike safety unit connected to two of the four strands in the Health/PE curriculum. The first strand has an overall focus on Personal Health and Physical Development. Regular physical activity and safety management are both included in this strand. The emphasis on bike-riding as a

means of commuting to school, and the challenges of doing so safely, merged these two objectives. The fourth strand is called Healthy Communities and Environments. This strand is grounded in a 'health promotion' approach. One objective at level 5 reads:

Investigate and evaluate aspects of the school environment that affect people's well-being and take action to enhance these aspects. (Ministry of Education, 2007, fold-out insert).

The synergies with the safe biking focus are clear. Indeed this part of the H/PE curriculum could align readily with a statistical inquiry – or even a science inquiry. In the event Hayden aligned his focus with the emphasis on design that can be found in the technology learning area.

Elsewhere I have documented learning opportunities in English, drawing on another of the Transport Agency's published suite of curriculum resources (Hipkins, 2016). There is clearly no shortage of creative ways to draw on road safety as a rich context for traditional curriculum learning.

Locating the learning within the overarching NZC framework

It's the kids' voice as well as the adult voice (year 6 student)

It's motivating. We actually get to do the things [we plan]. Kids get rewards (year 6 student

[This learning] needs to be interactive to sink in and not just based on something bad (year 9 student)

I observe a lot more now (year 9 student).

NZC articulates a vision for education that will support young people to be and become "confident, connected, actively involved, lifelong learners" (Ministry of Education, 2007, p.8). Key competencies are a component of the curriculum framework that explicitly supports this vision. They are described as drawing on "knowledge, attitudes and values in ways that lead to action" (p.12). This focus on being ready, willing and able to act in the world is one important aspect that differentiates outcomes which include aspects of key competencies from more traditional learning outcomes.

All three teachers identified road safety education as an opportunity to help students to develop aspects of their key competencies. In order to demonstrate what they are capable of, students need space to think, decide and act with greater autonomy. As the short quotes above show, the students who were interviewed were very aware that their road safety learning experiences had provided this sort of active learning space and ownership of learning.

Awareness also plays an important role in building and strengthening key competencies. Hayden had been experimenting with a key competencies reflection tool to help students become more aware of instances when they had strengthened their overall capabilities. He noted that this had been only partially successful but it was clearly an idea he wanted to come back to.

Earlier research on the integration of key competencies with learning area content emphasised that the provision of rich learning opportunities was key to successful integration.⁹ The teachers interviewed for this earlier project typically envisaged and planned for dual learning goals. One set of goals pertained to immediate academic outcomes and the other set to some longer term outcomes in the context of students' likely future needs (Hipkins & McDowall, 2013). This pattern is also evident in the thinking of the three case study teachers. As outlined above, their immediate goals pertained to specific learning areas, while their longer term goals pertained to a range of safe road behaviour in students' futures.¹⁰

The *purposes* that teachers envisage for learning are just one of many types of pedagogical decisions they must make when designing rich learning experiences such as those outlined in the case studies. A consistent theme of earlier research on the role of key competencies in the curriculum is that what the teacher does to open up and support students to stretch and grow their current abilities is at least as important as what students bring to the learning to begin with (see Hipkins, Bolstad, Boyd & McDowall, 2014). Some of the many other ways in which the teachers supported the students, sometimes intuitively rather than explicitly, are outlined in the next subsection.

Pedagogical challenges and opportunities

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 (Chamberlain & Hook, 2012).

Drawing on recent insights from learning theory Mary Chamberlain and Pam Hook emphasise that *how* students come to know about road safety is as important as what they actually learn. How the learning action unfolds is as important as the curriculum planning that preceded it.

Eliciting demonstrations of capability

Recent assessment research has adopted a specific curriculum weaving approach based on the idea of student *capabilities*. These are things that students know how to do, and are willing to do, in specific action contexts. Capabilities that are challenging to produce (i.e. they stretch students),

⁹ Even though the initial focus was curriculum integration, this research was ultimately reported with the title “Key competencies and effective pedagogy”: see <http://nzcurriculum.tki.org.nz/Key-competencies/Key-competencies-and-effective-pedagogy>

¹⁰ One of the cases in the Effective Pedagogy project was also set in the context of road safety and centred on a Transport Agency resource: <http://nzcurriculum.tki.org.nz/Key-competencies/Key-competencies-and-effective-pedagogy/Engaging-examples-of-practice/Road-safety>

and that link meaningfully to students' lives (i.e. they are open to transfer to new contexts), are likely to weave certain aspects of at least 2 or 3 key competencies with knowledge and skills from one or more learning areas of the curriculum. Because the envisaged capabilities are things that students *do* it is possible to look for explicit evidence of their development.

It is possible to envisage many different capabilities that students would ideally develop and it would clearly be impossible to focus on all of them. Analysis in the context of the National Monitoring Study of Student Achievement (NMSSA)¹¹ has identified a small number of capabilities that are highly likely to be needed when demonstrating a wide range of types of learning.¹² One of this small group of capabilities is *perspective-taking*. Opportunities for perspective-taking have both rational and emotional components. They also involve recognition that people do what they do for reasons that make sense to them in the moment. Perspective-taking draws on aspects of critical thinking, reflective awareness and self-management, values analysis, and knowledge of other types of differences between groups. It “underlies a host of social-emotional learning outcomes” (Gehlbach, 2017, p.8) and – importantly – can be strengthened with the right sorts of learning experiences. In summary, although challenging to produce, learning to take other perspectives is a capability that is vitally important to students' futures.

The case studies show that opportunities to practice perspective-taking were central to the learning planned and orchestrated by all three teachers:

- In the design technology unit students were challenged to put themselves in another's shoes, so that they could create a poster that would reach the intended audience without being alienating in its key messages.
- The students in the Travelwise group needed to think about *why* others behave as they do. This laid the critical thinking foundations for planning events that would encourage changed behaviours – both in terms of rewards and sanctions. Membership of the group provided these students, who are still at primary school, with opportunities for deep learning about the complexities of human behaviour.
- An explicit aim of the safe biking unit was to support students to gain a sense of what it might be like for car drivers to share the road with cyclists. Analysis of the GoPro footage showed them just how quickly situations develop, and the implications of the unpredictability occasionally displayed by both drivers and cyclists.

All these encounters were sufficiently demanding to stretch students' perspective-taking capabilities. They also brought a strong emotional dimension to the learning. This is a critically important component of learning experiences that build dispositions to act in certain ways.

¹¹ <http://nmssa.otago.ac.nz/>

¹² Reports are pending at the time of writing.

The challenge of building dispositions for safe behaviours

People's perceptions of their ability to carry out the desired safety practice, referred to in Social Cognitive Theory as their self-efficacy, is an important factor affecting behaviour. Further, this theory explains that people's conceptions of what is appropriate is influenced by observing behaviours, attitudes, and emotional reactions of others, who might serve as positive or negative models (Guttman, 2015, p.154).

In this quote, Nurit Guttman is talking about communication campaigns rather than school-based education per se. However the point is pertinent in both types of contexts. Table 1 above has noted that effective road safety education is not 'preachy' or negative. Instead, the challenge is to build a positive climate in which doing the right thing is seen to be the normal and desirable behaviour. Building such positive self-efficacy is demanding and requires ongoing reinforcement. The many different contexts and angles that can be taken on road safety education certainly help to meet this need.

Arguably, the whole-school approach to road safety described in the third case study provides an ideal context for building a climate in which doing the right thing is seen as normal. In multiple ways, every day, students are immersed in a culture in which safe road behaviours are modelled and reinforced by peers and teachers alike. Also worth noting are the efforts of the staff and Travelwise student group to involve the wider local community in maintaining safe practices in contexts where students observe the behaviours of other adults on a daily basis. The second case study demonstrates a different way of leveraging opportunities for self-efficacy and seeing safe and responsible behaviours as normal. In this case *community service values* that are an espoused aspect of the school's vision were brought to bear.

Meaningful emotional engagement is an important motivator for building dispositions to act in safe ways, and to continue doing so when out and about in wider community contexts. Positive self-efficacy is also supported by building greater awareness of the values that drive personal behaviours in different contexts. Being aware of potential consequences, and rehearsing appropriate responses to challenging contexts, potentially also make important contributions to building dispositions to behave in safe ways. In the first case study, the compelling nature of the Go Pro footage made a direct and powerful contribution to this aspect of building knowledge and dispositions for safe cycling and driving behaviours. Less directly, but also powerfully, designing the playing action for the road safety Game Design Competition also helped build awareness without being preachy or negative. (Some students in all three schools took part in this competition).

Assessing learning gains

It is not easy to measure changes in students' learning about skilled and active citizenship. Yet without some form of assessment, we cannot determine if the Transport Agency educational approaches to exploring citizenship are effective in changing their knowledge, skills, attitudes, and/or behaviours in this area. (Hook, 2014, p.11)

All the case study teachers reported using the SOLO taxonomy (Structured Observation of Learning Outcomes)¹³ to assess and report on students' learning gains. This consistency no doubt reflects input from educationalist Pam Hook, who has worked with teachers on the Transport Agency's curriculum panels to help them develop their creative ideas into resources that can be shared with others. The quote above shows that the inclusion of specific assessment resources has been a considered and important part of the overall development.

SOLO is used to make judgements about the *quality of thinking* demonstrated by students and about how they use their knowledge *in action*. Thus both declarative and functional knowledge are taken into account. Hook notes that this taxonomy allows teachers to differentiate between: bringing in ideas; relating ideas; and extending ideas to make new connections, both in terms of knowing and doing (Hook, 2014, p.3). The different levels of thinking and doing implied by this taxonomy are illustrated by the blue bars in the three right-hand columns of the figure on the next page.






Hook identifies the deeper outcomes captured by SOLO metrics as a characteristic of learning that "sticks" (ibid, p.3) and hence that is both useful and used by learners. However she also notes that learning that leads to such outcomes needs an investment of sufficient time, so that students can make links between ideas and reflect on how learning connects with their lives. These arguments in support of SOLO were evidently persuasive for the case study teachers. They all reported the taxonomy to be a useful assessment tool that had helped them expand their thinking about learning goals.

The known challenges of effective road safety education have already been outlined. One clear message is that declarative knowledge might be necessary but it is not sufficient to ensure any new learning will be acted on. What students show they can do, and are willing to do, is also an important part of their learning. With this imperative in mind, the figure on the next page demonstrates how SOLO can be used to make judgments about observed behaviours. This example has been copied from a unit of work recently added to the Transport Agency Education Portal, based on Hayden's safe cycling case study.

¹³ For more detail of the origins of this taxonomy and what it sets out to achieve see: <http://www.johnbiggs.com.au/academic/solo-taxonomy/>

Figure 1 An example of the use of the SOLO taxonomy in a road safety unit

demonstrate: social responsibility: respect rights feelings others 

Hellison's Model of Social Responsibility					
<p>I can demonstrate RESPECT for the rights and feelings of others.</p> <ul style="list-style-type: none"> Show self-control Include everyone Solve conflicts peacefully Does not disrupt the work and play of others 	<p>I need help to know what [RESPECT for the rights and feelings of others] looks like</p> <p>It is not my problem – everyone for themselves – dog eat dog kind of world – if I didn't do it someone else would've.</p>	<p>I can demonstrate [RESPECT for the rights and feelings of others] if I am reminded.</p> <p>I can care for others if I am directed/reminded.</p>	<p>I use several strategies to demonstrate [RESPECT for the rights and feelings of others] but I am not sure when and or why to use them.</p> <p><i>(trial and error – aware of strategies but not sure why or when to use them so makes mistakes)</i></p> <p><i>I can give it a go but I sometimes forget and rely on others</i></p>	<p>I use several strategies to demonstrate [RESPECT for the rights and feelings of others] and I know when and why to use them.</p> <p><i>(strategic or purposeful use of strategies – knows why and when).</i></p> <p><i>I am on to it – I keep an eye out for others - explain why/justify</i></p>	<p>AND ...</p> <p>I can encourage others to [RESPECT for the rights and feelings of others]</p> <p>I act as a role model for others to help them [RESPECT for the rights and feelings of others]</p> <p>I extend this to other contexts outside of school – e.g. has become part of who I am - habitual – I become irritated if something prevents me from acting in this way e.g. checking my cell phone</p>
<p>Effective Strategies</p> <p><i>[insert strategies suggested by students and teachers]</i></p>	<p><i>Show them examples.</i></p> <p><i>Opportunity to practise.</i></p>	<p><i>Clear instructions (step-by-step).</i></p> <p><i>Prompting.</i></p> <p><i>Situational teaching.</i></p> <p><i>[External feedback]</i></p>	<p><i>Revisit, recap & remind!</i></p> <p><i>debrief</i></p> <p><i>Role play</i></p> <p><i>[Internal feedback start]</i></p>	<p><i>Repeated opportunities to practise</i></p> <p><i>[At level]</i></p>	<p><i>[Beyond level]</i></p>

Source: <https://education.nzta.govt.nz/news/national/cycling-stars-in-new-health-and-pe-curriculum-resources>

Students were also able to practice self-assessment and access peer feedback about their learning efforts in all three schools:

- The primary students made use of class blogs to share their learning with others in the community. Virginia pointed out that responses posted to these blogs constituted a form of feedback.
- Trialling their game prototypes acted as a form of self and peer assessment of students' creative solutions to educating others about their chosen aspect of road safety. John noted that one lunch break had been used for this purpose at his school. Any students who wanted to play were invited to come and do so. In retrospect he saw a missed opportunity to gather feedback more systematically than actually happened on the day.
- Hayden had experimented with self-assessment of key competency development via reflective journaling, with limited success. It is noteworthy that the SOLO rubric above is

based at least partly on Hellison's Model of Social Responsibility – a self-assessment model that is popular with PE teachers in New Zealand.¹⁴

For students in the senior secondary school, road safety can provide a powerful and motivating context for NCEA assessments. In a different project, one teacher explicitly linked the powerful *emotional* component of learning in this context with increased NCEA success. Students engaged and stayed engaged with demanding learning and were less motivated by the prospect of gaining NCEA credits as can happen in other contexts (see Hipkins, Johnston & Sheehan, 2016, Chapter 11, Assessment in Context).

¹⁴ For example this model was widely used by PE teachers in the Sport in Education project funded by Sport New Zealand: <http://www.sportnz.org.nz/managing-sport/search-for-a-resource/programmes-and-projects/sport-in-education-project->

4. Road safety education as education for citizenship

The New Zealand Curriculum (Ministry of Education, 2007) has placed a heightened priority on citizenship as a cross-curricular theme, alongside the key competency of *participating and contributing* and more active forms of citizenship within subject areas such as social studies. ... However, while there is growing interest in citizenship education, there is less agreement about what form citizenship education should take and how teachers should juggle the competing expectations of programmes. (Hayward & Wood, 2014, p.1)

When students think of the road as a ‘commons’ – a shared place where everyone understands and follows rules and expectations, and where everyone responds appropriately to enable all citizens to have safer journeys – then they have an authentic model for citizenship that is already deeply embedded in their own experience; they have agency. (Hook, 2014, p.4)

The first of these quotes positions citizenship as a visionary but problematic aspect of the national curriculum. It is a desirable but sometimes contested high-level goal for education, and one that might be difficult to fit into an already overcrowded curriculum. The second quote indicates that the development team working with the Transport Agency have thought carefully about the challenges of defining what citizenship might mean in the context of road safety education. Their vision treats the overall roading system as a ‘commons’, which helps explain the emphasis their educational materials place on developing systems thinking (see case study 3).

The crowded curriculum challenge is addressed by modelling a sophisticated weaving of higher level components of NZC, such as the key competencies, with learning area content, all within an overarching aim of developing and sustaining awareness of road safety challenges, and of building dispositions to act to help keep the roads safe for everyone. While the three cases documented in this report are only a snapshot of the many case studies that could potentially be completed, the successful outworking of this weaving vision is clear in all of them.

The Transport Agency’s approach can only work if and when teachers build a new type of narrative about what learning is for – a narrative that values both traditional curriculum goals (building new knowledge and skills) *and* less familiar future-focused goals such as citizenship. The latter type of goal directs attention to the importance of building deep engagement and the disposition to care about what is being learned and assessed. Students also need to build their action competencies – the ‘know how’ and willingness to plan and carry through on ways to stay safe personally and to keep everyone else safe to the extent that this is possible for individuals to do. Again, there is clear evidence that all three teachers had these longer term goals in mind,

and that they were willing and able to make space for their students to take greater agency for their learning.

There is also clear evidence that their learning experiences in 2016 were still vivid for the interviewed students in 2017. Across their range of ages, all of them displayed an awareness of, and commitment to, attitudes and values of responsible citizenship with respect their use of the road commons. All of them could articulate gains in knowledge and awareness and all of them reported enjoyment of the learning approaches used by their teachers.

These findings indicate that, where the intended approach is adopted with fidelity to the Transport Agency vision, the ensuing educational encounters are powerful and memorable for students and teachers alike.

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