

Expanding our Concept of Best Practice in Road Safety Education - A Review of Current Evidence and Practice

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Biography

Dr. Jane Elkington has worked in injury research and prevention for over 15 years. She was the injury prevention manager for NSW Health for six years before commencing her own consultancy in 1997. Jane has been on several state and national ministerial advisory committees including the Australian Advisory Committee for Road Trauma (1995-98), and the NSW Road Safety Taskforce (2001 – present). She is on the Board of Directors of Youthsafe. Jane has worked on numerous road safety research and planning projects for a variety of state and local government agencies and non-government organisations. Her current paper is based on a research project undertaken for the National Roads and Motorists Association.

Abstract

The purpose of this research was to identify current practice and current evidence on best practice in road safety education (RSE) for primary school children. A review of the literature and websites and interviews with 30 key informants in road safety education were conducted. Articles and reports were assessed against criteria on quality of evidence. Interview responses were summarised by qualitative assessment processes examining key themes and directions. Findings indicated current practice in RSE focuses on classroom techniques with growing attention to curriculum-based learning that is largely teacher delivered and involves elements of participative learning. Outcomes of interest focus on the development of appropriate road safety knowledge and attitudes; few addressed behaviour. There is still support for the established best-practice principles of classroom lesson-based RSE, that is being teacher delivered, curriculum-based, involve participative learning, narrow in focus and delivered over multiple occasions. However, there is growing evidence and shifting practice towards extending the concept of RSE beyond an emphasis on knowledge and attitude development. Many key research authorities and their publications indicate that when it comes to RSE for children, newly recognised elements of best practice include: strong practical training components in the real environment, involvement of parents, strategies that address the learning styles of boys, and strategies that are supported through whole-of-school and whole-of-community approaches. These latter elements seek to build skills that are learned amidst the reality of complex real environments and reinforced through the support of parents, schools and communities.

1. AIM

The aim of this research, conducted end of 2002-beginning 2003 and commissioned by the National Roads and Motoring Association (NRMA), was to identify current practice and current evidence on best practice in road safety education (RSE) for primary school children. The findings and their implications for the delivery and focus of road safety education are presented here.

2. METHODS

A review of the literature, websites and interviews with 30 key informants in road safety education were conducted. The review of the literature included reports that presented evaluation studies (other than process evaluation) or review articles on the effectiveness of road safety education strategies for children from 1997-2002. Reports were assessed using an adaptation of the NHMRC document: *Guidelines for the development and implementation of clinical practice* (NHMRC, 1995) that the consultant developed for previous literature reviews to assess the quality of research articles. Each relevant article was assessed as providing either “strong”, “reasonable”, “fair” or “weak” evidence with regard to the effectiveness of the strategy being evaluated.

Interviews were conducted with key school and youth road safety specialists within Australia and New Zealand. These specialists, including road safety researchers, road safety education consultants to the education sector, policy and program developers in school and youth road safety, were asked to provide, where possible, advice on: current models of practice in their area, available research that provides evidence of the effectiveness of any models of practice of road safety education with children, and their understanding of existing gaps and future opportunities for Road Safety Education (RSE) of children. The responses from the interviews were summarised by qualitative assessment processes examining key themes and directions.

3. RESULTS

3.1 Current RSE Practice

RSE could be summarised as being currently presented through one or more of three approaches:

- **Classroom techniques** - including lecture style, written exercises, peer collaboration/discussion, videos, interactive activities such as role plays or activities on the web etc. Knowledge and attitude change are the key outcomes.
- **Simulation techniques** - which range from mock-ups in the classroom or playgrounds, to interactive displays in halls and special venues, to blocked off streets and mock crashes or mock traffic situations. Skills development or attitude change are the key outcomes of these approaches.
- **Practice in the real environment** - which seeks to build skills in a complex real environment and lead to behaviour change - through a clearer understanding of the complexity of the task and the consequences of their actions.

Cutting across these three approaches are a mix of strategies that are being applied in a variety of forms. Current practice was seen to currently have the following areas of emphasis:

Curriculum-based. While some areas ensure that road safety education is embedded in the curriculum of physical education and health courses, many of the newer initiatives are taking steps to see it is a component of multiple, sometimes all, curriculum areas. Across all age-groups, RSE programs now typically include, if not emphasise, elements of interactive learning. Learning theory has indicated that children learn best when they have the opportunity to try things out, discuss or debate, or be creative with respect to the learning area. As a result, role plays, class or group discussion, hands-on interactive activities, for example, are now common elements of most programs

Greater skills component. Throughout Australia, road safety education programs are increasingly emphasizing the importance of skill development. Several bicycle education programs focus on developing safe riding skills, similarly for pedestrian safety among young children. Much research promotes the importance of practicing skills in the real environment

– where the complexities of the task can be fully processed. In an older age group, novice drivers, the importance of skill development in real settings is well recognised. The NSW licensing requirements (the Graduated Licensing Scheme) include 50 hours of real driving experience in a variety of traffic conditions.

RSE within a supportive school and community settings New Zealand and many states within Australia are introducing road safety education alongside school policy development strategies and supportive community-based programs such as Safe Routes to Schools. Originally a Victorian model, currently New Zealand and at least five states in Australia have Safe Routes to School programs. NSW, and other states, also have invested in funding crossing supervision programs, and the introduction of 40km/hour zones around schools during school arrival and departure times.

Boys as a target audience. The House of Representatives Standing Committee on Education and Training (October 2002) report that boys have somewhat different learning styles to girls, tending to prefer: more structured activity, clearly defined objectives and instructions, short-term challenging tasks, and visual, logical and analytical approaches to learning. Two other issues identified by the Standing Committee relevant to the development of RSE are 1) the importance of peer relationships to boys, particularly during the middle school years and 2) the importance of male role models. These issues should also be considered when developing RSE resources for young males.

3.2 Available evidence

How effective are current programs?

Program effectiveness depends upon the outcome of interest. If we go straight to the heart of the matter – a reduction in injuries – we simply cannot say. The reality is there is so much “noise” in trying to trace the impact of any one program on eventual injury outcomes – that it is not even a realistic goal. If we are interested in a behavioural outcome (as a predictor of injury risk) the evidence is very slim. A handful of studies have included a short-lived observational component – most do not get that far. If the outcome of interest is attitudinal change – in many cases this has been attained – at least in the short-term (for up to six weeks after the program). If the outcome is knowledge and awareness – on the whole most educational programs have been able to demonstrate an effect. However the link between injury outcome and knowledge and attitudes is not well established.

Classroom. By far the most frequently used approach is classroom education. Within that, the majority of the learning process is verbal, with some visual support such as books, posters, brochures (Thomson et al., 1996). By and large there is agreement that this approach will have limited impact without other strategies to complement the shaping of road safety knowledge, attitudes and skills.

The success of school-based programs has been shown to be dependent on a number of factors of which one critical success factor is the professional development of teachers (Elliott 2000). There is a rapidly growing focus on supporting teachers in their delivery of road safety. The model of the main source of information being an outside presenter is now rarely found other than to provide specialist input (such as ambulance officers providing first aid instruction, or police officers providing input regarding road use and the law).

Printed material There is no evidence that printed material alone (books, posters, brochures) improves road safety behaviour. There is evidence to say that such material increases a child’s knowledge of road safety (Thomson et al., 1996; Zeedyk et al., 2001) but in the few studies that have looked at a child’s road safety behaviour, the use of visual

material is used in conjunction with other strategies (Thomson et al., 1996). When these visual stimuli involve some degree of problem solving or interaction with peers, then they have been shown to have an increase in road safety knowledge (which has been retained for six months) (Zeedyk, et al., 2001).

Theatre. There are RSE resources available that include the use of theatre. Within the scope of this literature review, there appears to be no evaluation that assesses road safety behaviour change associated with this strategy, however, one study did provide evidence of a link between theatre approaches and improved road safety knowledge and attitudes (Powney 1995).

Film and video techniques There is some evidence to suggest that the use of video, particularly when used as a form of feedback on a child's road crossing behaviour is associated with improved behaviour (Rivara, 1991).

Computer-based (CD-ROM) RSE resources Receiving growing interest is the use of computer-based resources to teach RSE. There appears to be some evidence that, coupled with teacher support, children who used computer-based resources as part of their RSE showed improved road safety (pedestrian) knowledge (specifically, safe place finding; roadside search; gap timing and perception of others' intentions) (DFT, 2002; McComas et al., 2002) and when also supported by real-life training showed improved road safety behaviour (Remenyi, 2002; DFT, 2002).

Evaluations of Australian computer-based programs concluded that:

- many students and schools used old computers and so various CD-ROMS were incompatible or couldn't function properly using those systems;
- the most favourable findings (those showing increased road safety behaviour) also incorporated either other instruction or on-road training;
- computer-based resources could positively affect hazard and risk conceptualisation in the learner driver age group
- teachers and students require support to implement and use the programs to their fullest extent
- a simulation activity needs to be participant driven and teacher directed (Moller, 2000; Remenyi, 2002; and Newman et al., 2001).

Practical Training. Programs that offer practical learning of skills for young children in particular as well as for novice drivers, appear to have the strongest evidence of being effective (Thomson et al., 1996; Rivara et al., 1991; Duperrex, 2002, Elliott 2000). Skills-based training in the real environment operates on the principle that from crossing the road to learning to drive, children are faced with a complex task for their stage of development. Once again, one of the issues with many of the evaluations of practical training strategies is that many serve as an adjunct to classroom education or visual (models of roads) strategies and few evaluations separate the strategies. Road safety issues that have been the focus of practical training or skills development are:

i) *Child pedestrian behaviour*

Evaluations have shown that strategies that take children out into real situations, and even simulated as-real situations result in improved child pedestrian behaviour. This was most noted in *younger* children (Thomson et al., 1996). Furthermore, programs that are multi-modal and programs that involve parents are likely to be most successful in altering behaviour (Thompson, 1998).

A review of the literature on pedestrian skills development among young children (Harbourview 2001a) examined eight evaluation studies. The findings (added to those of an earlier review) indicated that effectiveness of the pedestrian skills training interventions varied considerably. Eight studies evaluating the behavioural and injury outcomes linked with pedestrian training programs for young children suggested that:

- Educational approaches can increase children's knowledge of pedestrian safety;
- Training in real street situations has potential for changing unsafe behaviours; and
- Parent education component is needed to maximize success.

ii) Bicycle helmets and bicycle handling skills

There appears to be mixed evidence of the impact of practical training on bicycle handling skills (Macarthur 1998; Colwell 2002; Carlin et al., 1998). Elliott's review of RSE strategies (2000) indicated that while all cycling education courses were effective the ones that were most effective were those which included an on-road training element and conducted over several weeks, and the multi-stage course with each stage being completed at a different age.

The key to some of the mixed findings with respect to the impact of Bike Education appears to depend upon whether the program was run for long enough, with age-appropriate strategies, led by teachers and reinforced by parents.

iii) Learner driver / young driver

There is scant evidence to suggest that off-road facilities (children's traffic schools; driver-training centres) reduce road accident risk (Christie 2000; Haworth et al., 2000). Most evidence suggests that off-road driver education has no real positive effects and, in some cases, increases in "accident involvement through increased confidence" has been reported (Haworth et al., 2000; Roberts 2001; Whitebread, 2000).

These researchers conclude that the best learning environment for young drivers is the real-road experience in a controlled situation, hence the impetus for Graduated Licence Schemes (GLS) accompanied by publications assisting parents as driver educators and young drivers (e.g. VicRoads 1998).

4. CONCLUSIONS

From the current review of the literature and consultation with road safety education specialists, the following conclusions have been drawn:

- Best practice principles in classroom-based RSE that continue to be supported by the evidence and are reflected in current practice include being teacher delivered, curriculum-based, involve participative learning, narrow in focus and delivered over multiple occasions (particularly for boys)
- Current evidence also suggests that road safety needs to be more recognised as a set of skills that need to be developed (not just an attitude or level of awareness) and that these skills are best developed through practice in real settings.
- In primary and pre-driver road safety education there is growing support for the movement from RSE being student-based to school-based to community-based – thus there is a need to expand the supportive contexts in which RSE is delivered.
- And with this latter finding, grows the importance of collaboration with all major partners, including parents and the wider community, in planning and coordination.

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Key words

RSE (road safety education), children, best practice, review