

TEACHING CHILDREN IN DEVELOPING COUNTRIES TO BE SAFE ROAD USERS

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1 INTRODUCTION

Road accidents continue to be a major health and social problem for both developing and developed countries. World-wide around one million people are killed in road accidents every year, with about 70 per cent of these accidents occurring in developing countries. These countries have a serious - and usually growing - road safety problem, with fatalities per 10,000 licensed vehicles up to 20 times higher than the rates in developed countries. The financial cost of fatal road accidents in developing countries every year is estimated to exceed US\$ 35 billion.

In many developing countries, pedestrians are a particularly vulnerable group of road users. In Asia, Africa, the Caribbean and the Middle East, more than 40 per cent of reported road accident deaths are pedestrians, compared to 'only' about 20 per cent in Europe and the United States. Furthermore, certain types of pedestrians, such as the young, have been identified as being especially at risk in these road accidents. Accidents involving children less than 16 years of age on average contribute to 20 per cent of pedestrian fatalities in developing countries making them a major safety problem and cause for concern.

Figure 1: Children crossing a busy road in India



Many children who have been injured as pedestrians require long-term medical treatment and care. This can be a considerable economic burden for the injured child's family. Young pedestrian casualties generally come from the poorer sectors of the community (Christie, 1996; Ghee and Anstrop, 2000). In these sectors, the loss to the family is twofold: firstly the cost of caring for the injured child and secondly the loss of the income that the child earns or will earn. This loss of income means that the injury or death of a child can bring a poor family lasting financial hardship as well as personal grief.

A major contributory factor in many of these accidents is a lack of road safety knowledge leading to unsafe behaviour by children (see Figure 1). Research in

developing countries has shown that in general children's road user knowledge is poor when compared with children in developed countries such as the UK (Downing and Sayer, 1982). If children are to be safe when near traffic, they must have adequate knowledge, understanding and skills to cope with the dangers of traffic. Teaching children road safety as part of their normal school timetable can be an effective way to provide them with such knowledge and understanding. This together with practice and exercises outside school can help them to apply their knowledge and develop skills. This type of education both helps children avoid road accidents when they are young and makes them safer when they become adults.

Many children receive no road safety education (RSE). A survey of over 1000 schools in selected developing countries revealed that less than half taught road safety (Sayer and Downing, 1996). This failing can be addressed, in part, by raising the awareness of the importance of RSE among Ministers of Education, teachers, senior decision makers and within the general community. However, simply raising awareness of the need for improved such education is not enough. There is also the accompanying need to provide teachers with effective materials and ways for teaching road safety. Alongside the provision of teaching materials, there is the need to train teachers in their use. To sustain these activities, senior administrators and curriculum development authorities must be aware of, and convinced about, the necessity of RSE and their role in delivering it.

There are significant cultural and infrastructure differences between developing and developed countries. These encompass differences in educational systems, teaching practice, traffic regulations and road use. It is important that the road safety teaching methods and materials used in such countries have been researched and developed in the country where they are being used - or at least in similar countries. Simply attempting to transfer strategies and practices for road safety education from developed to developing countries is unlikely to be effective. For this reason, the UK's Transport Research Laboratory (TRL) has been working in developing countries to research and develop education materials and approaches that do provide models of good practice for schools in the host country.

This paper provides a brief review of how TRL has set about providing RSE materials and developing courses to train teachers in the best use of the materials in Africa and Asian. It describes research projects that have been funded by the UK's Overseas Development Agency (ODA) and the Department for International Development (DFID).

It should be noted that at the same time similar research has been conducted in the UK to develop materials for use by British teachers and children (Ampofo-Boateng, 1987; Thompson et al, 1996; Harland et al, 1991). This means that the overseas projects have been constantly supported and refined by the British research.

2 RESEARCH METHOD AND OBJECTIVES

The general methodology of this research programme was firstly, within each country:

- to take account of any available road accident information (for example to identify the main circumstances of child accidents)

- to understand the prevailing traffic conditions
- to survey children's road safety vocabulary, knowledge and awareness
- to explore the extent and structure of the existing education system.

Teaching materials – aimed at helping the teachers as well as the children - were then developed and evaluated in a sample of schools.

Because these evaluations involved young children, whose understanding of language, particularly English, could be limited, special techniques, such as the use of models (of roads, traffic and pedestrians) and role-play, were developed to test the ability of trained children to behave safely. The evaluations measured the children's road safety knowledge, attitudes and behaviour before and after they had received the safety training. Although ideally the evaluations of the resources would have used accident statistics (or even observed behaviour) this was not possible given the short-term nature of these projects.

The underlying objective of the research was to teach children to be safer road users by developing:

- knowledge and understanding of traffic and road risk
- the behavioural skills necessary to survive in the presence of traffic
- knowledge of the causes and consequences of road accidents
- a responsible attitude to their own safety and to the safety of others
- understanding of their responsibilities required by the rules that influence road traffic.

Research in the Netherlands and the UK has shown that children best develop road safety skills and understanding either in a real traffic situation or in circumstances that provide a very good simulation of the real world. The style of training should be a participatory approach that fosters understanding and appreciation rather than a simple didactic presentation of rules (and road signs) to be learnt by heart and that may not be properly understood (Rothengatter, 1984; Ampofo-Boateng and Thomson, 1990).

A key element of the TRL programmes was the intention to produce an ongoing and sustainable improvement in RSE in the participating countries. Thus the involvement and support of key (local) stakeholders was seen as a high priority. This meant that local ministries and authorities, as well as researchers and safety practitioners were always involved in setting up, designing and managing the programmes.

The teacher-training resources and the child-training exercises were designed to match as far as possible the training materials and methods recommended by the national or regional educational ministries. This meant that teachers participating could relate the road safety training to their other teaching and feel secure in the development of additional skills. In addition materials adapted to local circumstances would take account of the class size and local limits on the availability of general teaching resources.

3 PRINCIPALS OF RSE

The extensive body of research chiefly conducted in more developed countries (Rottengatter, 1984; Thompson, 1991; Harland et al, 1991) has identified a number of key elements with respect to teaching children to be safe road users.

Ideally RSE programs should begin at the pre-school level and should continue throughout the child's school life. They should be based on practical training in a realistic road environment and use teaching methods which follow the principles of child development (for example, under the age of 6, children cannot imagine themselves in someone else's position, and under 11 they find it difficult to focus only on what is relevant). Also, the training needs to be regular and frequent and thus should have a formal place in the school curriculum. Ideally, school programs should be reinforced by community safety schemes

These 'guidelines' have been summarised as the 5 'Ps' of RSE (see TRL's Overseas Road Note 17), which suggest it should:

begin	Pre-school
be	Practical
follow	Principles of child development
be	Presented frequently
have a	Place in the school time-table.

While each of these are important, it is especially vital that courses and materials must be progressive and designed to take account of the developmental age of the children for which it is intended, the social and cultural context and the child's traffic environment. The programmes must include effective training for the teachers who will be using the materials in the classroom. Finally, the programme must persuade senior education administrators and curriculum development authorities to make road safety a continuous and sustainable educational subject. Ideally, the achievement of these items should be both tested and supported by objective evaluation of the new programme.

4 CHILD DEVELOPMENT AND RSE

A child can only be taught what he or she is able to comprehend so RSE needs to take account of their cognitive and social development. This development is usually related to their age so that a road safety curriculum (and the rest of what is being taught in school) can be based on their age and/or the number of years they have attended school. A very abbreviated review of what RSE is appropriate for what age of child is given below; TRL's Overseas Road Note 17 gives a much more detailed curriculum based on the child's age.

Under the age of 4 children are considered too young to be given responsibility for their own safety near traffic. This means that they should learn to:

- hold hands with older children or adults near the road
- walk only on footpaths, or at the edge of the road
- play in safe places away from traffic
- recognise roads are used by traffic, as well as people, and that they are dangerous
- develop a simple road safety vocabulary.

Children aged from 5 to 7 are often required to take more responsibility for themselves, and should:

- learn that they should, ideally, be accompanied near busy roads
- know to stop, look and listen before crossing a road
- know safest places to cross the road near their home
- know how to get to and from school safely
- have an extended road safety vocabulary
- understand that accidents can lead to injury and death
- understand that they have a role in behaving safely.

Children aged from 8 to 12 in developing countries may have as much independence and freedom as an adult, At this age they should:

- understand the concept of differing speeds by observing traffic
- understand about visibility, conspicuity, adverse weather, vehicle control and braking
- understand the need to be seen near and in traffic and know about the hazards of stationary vehicles and how to cross the road near them
- know when and how to summon help in an emergency
- understand needs of special groups, eg the very young, old and disabled
- understand immediate and long-term consequences of road accidents
- understand problems caused by domestic and wild animals near roads
- set a good example to younger children.

Children older than 12 in developing countries almost invariably are expected to have the independence and responsibilities of an adult. At this age they must know:

- how to behave while travelling by themselves on public transport
- how to ride a cycle on the road
- traffic rules and regulations (and why they exist)
- how road accidents are caused and how to reduce risks
- observe traffic and be able to judge speeds and distances
- simple first aid and how to assist adults in the event of an accident.

5 APPROPRIATE AND SUSTAINABLE PROGRAMMES

TRL's overseas RSE programme is rooted in both past and on-going research on child development and road safety conducted in more developed countries, (Molen, 1981; Rottengatter, 1881; DETR, 1999a, 1999b). Nevertheless, TRL recognises that what works in one country is not necessarily transferable, or even relevant, in another country. This means that RSE needs to be tailored for each country to take account of the education system in place, the peoples' beliefs, customs and way of life, the local traffic environment and, if it is to be sustainable, the available financial resources and administrative support.

Key elements in making the programmes appropriate and sustainable include:

- identifying and involving local stakeholders among the officials administering education, police, health services, roads and transport policy

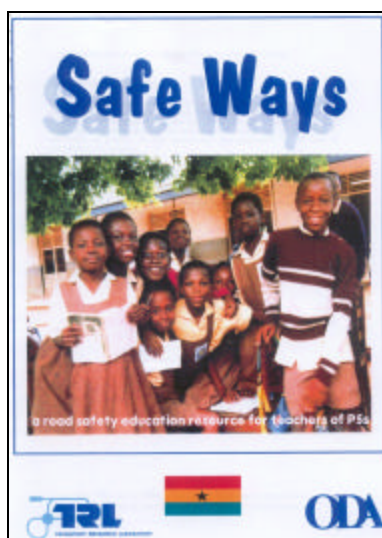
- preparing a program adapted to the cognitive development of children that can be delivered within the local school curriculum
- implementing a plan involving and training teachers and/or police, health workers and community activists, etc
- monitoring and evaluation of the programme to improve, update and identify lessons learned.

6 'SAFE WAYS' IN GHANA

The first significant RSE resource materials designed by TRL for use outside the UK were developed in Ghana (Sayer et al, 1997). These were for the use of teachers of children aged around 10 and 11 – the final year of primary education. This particular age group was selected for two reasons. Firstly they formed part of the highest risk age group, and secondly they were known to act as enablers passing on vital information, not only to parents, but in a much more practical way to younger siblings and friends in their care. Teaching road safety to younger children while escorting them to or from school would also reinforce their own understanding and skills.

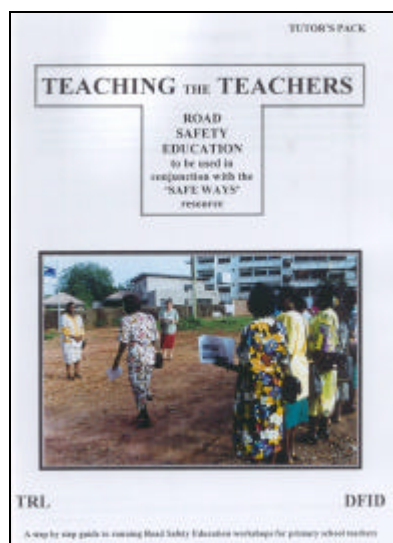
The resource (called 'Safe Ways' – see Figure 2) comprised five topics which covered: walking safely; observing the road environment; using protected crossings; crossing where there are no protected crossings; and choosing safe routes, for example to school. The general educational ethos of the Safe Ways training was one of active participation.

Figure 2: Cover of the Safe Ways resource



The resource was tailored to the educational system within Ghana and, importantly, teacher-training materials (see Figure 3) were developed in parallel to the resource. The teacher training materials contained all the information needed to run teacher-training workshops. The workshops aimed to give teachers the knowledge and enthusiasm that they needed to use the Safe Ways resource to provide RSE in their classes and schools.

Figure 3: Cover of the Safe Ways Tutor's Pack



The evaluation phase of the project used an interviewer-administered questionnaire to test the children's knowledge of safe behaviour, unsafe behaviour and crossing behaviour. The groups of children who were exposed to the resource demonstrated a significant increase in knowledge in each of these three areas, compared with a control group who did not receive any road safety teaching. Thus there was clear evidence that the Safe Ways programme had been successful in achieving its aims. While it is acknowledged that ideally the evaluation should have focused on changes in behaviour or accident involvement, this was not a practical option for this research as the use of unobtrusive observation or having a sample size appropriately large to compare relative accident rates was unfortunately too expensive given the scope of the project.

It should also be noted that Safe Ways was only evaluated in English speaking schools, This brought the additional constraint that the level of English language used in the resource had to be understood by the children for most of whom English was their second language.

The development of the Safe Ways resource encompassed a broad perspective of theoretical and practical experience. In order that other countries might benefit from the study some 'Good Practice Guidelines' were developed (TRL Overseas Road Note 17). In addition to outlining effective teaching methods and content, the Guidelines include recommendations for administrators and policy makers on how to establish sustainable and effective systems.

A determined attempt has been made to make the Safe Ways programme in Ghana sustainable. The approach is supported by a National Road Safety Council and other government and non-government organisation (NGO) initiatives. A local person (formerly of the Ghanaian Ministry of Education) has been employed to continue training primary teachers, through workshops, and in particular how to use the Safe Ways resource with their classes.

7 'SAFE FEET' IN INDIA

Following the success of the Ghana study a follow-up project was carried out in India in the State of Maharashtra (Sayer et al, 2000). This resulted in a teaching resource (called 'Safe Feet' – see Figure 4) designed for use by teachers of children, aged about six, their first year of primary education. This age was selected because a detailed analysis of available accident data in India (in Bangalore) had revealed this was the age when child pedestrians were particularly vulnerable to injury.

Figure 4: Cover of the 'Safe Feet' Resource (Marathi Version)



It was designed to follow the elements of the existing competency based curriculum and 'joyful learning' approach to teaching that was recommended in *The National Policy on Education* published in India in 1986. The resource was designed to increase the children's observational skills and their knowledge and understanding of traffic. It ensured that they could recognise the dangers of traffic, behave safely as pedestrians and know what they needed to do to keep themselves and others safe.

The resource was produced in English and then translated into Marathi (the main language spoken in Maharashtra). The evaluation of the resource was conducted in both Marathi and English speaking schools and was done in two ways. The first method examined whether or not the materials improved the children's road safety knowledge, while the second involved a survey of the teachers who had been required to use the materials in the classroom. Both evaluations revealed that the materials were very effective in achieving their goals. There was a marked increase in children's road safety awareness and knowledge, and the teachers found the resource both effective and enjoyable to use for the children; as well as for the teachers themselves. However, the teachers did suggest a number of ways they felt the materials might be improved, the main one being the need for better visual aids or materials – such as a flip chart.

In addition, a small number of informal interviews were held with the head-teachers of the schools where the materials had been introduced. They were supportive of both the research and the use of the materials in their schools. They felt that teaching road safety was a valuable and necessary activity and was something that had not been attempted in their schools before the project. All reported that they would continue to

use the materials in their schools after the research programme had finished. At the conclusion of the study, many had passed the materials on to neighbouring schools. They also felt that similar materials were needed for older children and that the materials needed to be disseminated more widely throughout India.

To maximise the effect of the resource within Maharashtra and India it was felt that Safe Feet should become a permanent part of the primary school curriculum. With this aim, a Road Safety Education Awareness Seminar and Workshop was held at the end of the project for senior education administrators, police and other important safety decision makers and practitioners. All the seminar participants supported continuing the programme – although there was a question mark over the funding that would be required to help with dissemination and teacher training.

8 PRIMARY CURRICULUM FOR UGANDA

The British Council in Uganda, with funding support from DFID, is currently managing a comprehensive 'In-Country Training Programme'. Part of this long-term programme aims to provide support for road safety initiatives particularly within the areas of engineering, enforcement and education.

A prior review of the existing RSE situation had identified the need for resource materials, teacher guides and training. Surveys of schools and children (or 'learners' as they are called in Uganda since the adoption of Universal Primary Education) identified a serious lack of activity, knowledge and awareness with regard to RSE. This was in spite of previous efforts to introduce the Safe Ways resource (from Ghana) - even though it was recognised that this resource had been developed in another country and only covered a limited age range. Proposals for TRL to help in extending the materials available coincided with a review of the National Primary Curriculum (Volume 2) that took place in 2000. This provided a small window of opportunity when it was possible to arrange for the inclusion of RSE within the national curriculum. As a result a draft Primary School RSE Curriculum and accompanying Teachers Guide to cover the whole seven years of Primary education was produced in the required Ugandan format (Quimby, 2000). This was submitted to the Curriculum Strategy Group, for possible inclusion in either the Cultural Studies or Social Studies syllabus (previously included in the first published volume of the curriculum), or integrating it within a variety of 'carrier' subjects; a method previously adopted in Uganda to include Life Skills in the curriculum.

The curriculum was written following a survey that involved observing and interviewing approximately 500 primary school children from 50 schools in Kampala. Surveys in other regions were not undertaken because of the short time available – although similar information from more rural areas would have been valuable as the resource was intended to cover the needs of children living in both rural and urban areas

In line with the training element of the programme the Ugandan materials were produced with the assistance of local experts, for example from the National Curriculum Development Board (NCDB - an independent but partner organisation to the Ministry of Education) and local NGOs. In addition other organisations such as the National Road Safety Council (NRSC), the Traffic Police, related aid-funded programmes (eg World Bank) and the Injury Control Centre – Uganda (who acted as

TRL's local partner in the project) were involved in supporting and promoting the project.

In the light of previous experience in Ghana and India it was decided that the resource should be supported by a Flip Chart (rather than an expensive teachers guide or student textbook). This was developed to a stage where it would be relatively simple to design, manufacture and evaluate. It was not possible to complete these processes during the four weeks allocated for TRL's input into the project.

The curriculum breaks the elements to be taught during each year and term, and provide topics, objectives (main and specific), methods, teacher hints, etc. In addition the curriculum provides a detailed rationale, attainment targets and assessment methods. The resource produced was based on road safety being given, on average, about one lesson per week, although several of the topics to be covered could be integrated into other subjects, such as mathematics and science.

This syllabus was provisionally accepted and is expected to feature in the Volume 2 National Primary Curriculum planned for publication in late 2000. This means that the Ministry of Education will be committed to training teachers and delivering RSE to all Primary children in Uganda, starting in early 2001.

9 KEY ELEMENTS OF RESOURCES

Although developed for use in different countries and for different ages of children, there are a few key elements common to each of the three projects briefly described above:

- available accident information and surveys of children's' knowledge were used to understand the problem
- the resources were based on combining European 'good practice' with the local culture, transport, political and educational situation; it is not appropriate to merely translate western materials and use them in developing countries
- they have at their core, learning by practical experience near, though not necessarily on, roads
- they all are in the form of manuals for the teachers as opposed to materials directed solely at the pupils
- the teacher materials are a series of clearly set out lessons with consistent presentation in the style of curriculum materials of their particular countries
- the style of the training is an interactive 'joyful learning' process; avoiding the didactic approach where the teacher talks and the child listens
- the main research projects Included evaluation and monitoring as part of the development process.

10 CONCLUSIONS

This review paper briefly describes three recent projects undertaken by TRL, with ODA and DFID support, designed to promote RSE education in three developing countries: Ghana, India and Uganda.

Each project and all the resources produced were enthusiastically received by the relevant education authorities. Also the children themselves were very enthusiastic to learn and enjoyed the teaching methods employed. Importantly the teachers enjoyed using the materials and thought that RSE was a valuable addition to what they taught their children. Head-teachers were also very supportive.

Evaluation trials demonstrated that the materials produced significant improvements in the children's road safety knowledge and awareness.

However, education budgets in developing countries tend to be small. Despite strong local support for the introduction of RSE into schools there is still a long way to go before RSE is treated in developing countries as seriously as in developed countries.

11 ACKNOWLEDGEMENTS

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Final thanks are also due to ODA/DFID staff who supported these worthwhile programmes and continue to promote road safety for children in developing countries.

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