

Title

Towards survival on the road

– a whole-of-life road safety programme of learning for all road users

Author

– Graeme S. Horsnell - email: horsnell50@hotmail.com

Abstract

Pedestrians and cyclists have long been recognised as vulnerable road users, but walking and cycling safety are only two aspects of a fragmented, educationally-speaking, Road Safety scene. The making of educational links between the safety principles of being a passenger, pedestrian, cyclist and driver could serve to improve access to Road Safety Education for all road users. The Road Safety curriculum presented in this paper is designed as a whole-of-life concept and as such is not an exclusively school-based concept. There would, however, be the option of the relevant parts to be taken up by educational institutions at all levels. It is formatted in such a way as to make it accessible using a multitude of means, both electronic and hard copy. The level of language used is intended to be straightforward and concise, meeting the needs and expectations of the target audiences.

This Road Safety curriculum is based on best practice design: it employs the scaffolding technique which establishes the scope (breadth or content) and sequence (order) of the concepts to be presented and learnt. With minor modifications this curriculum could be applied to a left-hand drive environment.

Great effort has been made to show connections between principles of passenger safety, pedestrian safety, cycling safety and driving and appropriate emphasis is placed on the concept of readiness for learning and the development of independent road use: individuals cannot be allowed to face foreseeable dangers for which they unprepared. This model of learning adopts a conservative approach based on what has been found in the research in the field of human growth and development. Progress charts are an integral feature in each section of this Road Safety programme.

Key words

scope and sequence, Road Safety curriculum, scaffolding

Method

A scan of available educational research in the fields human growth/development and educational theory was undertaken. Also, a scan of educational approaches in Road Safety in both English and non-English speaking countries was carried out. Of particular interest were the educational connections between the needs of the various road user groups, the approaches taken by school education and non-school education groups and authorities. Accessibility to Road Safety education materials by parents/caregivers was investigated.

Results

The OECD's paper "Keeping Children safe in Traffic", see (1) emphasises the holistic and lifelong approach to Road Safety with practical skills development included as being the best basis on which to build the educative process, but this needs to be balanced against the fact that it is difficult, if not impossible, to pinpoint the effect of education programmes as pointed out by RoSPA (2). In WA evaluation has been undertaken and the details are found at (3) with some similarity of outcome. The conclusion to be drawn from this research is that costs need to be kept to a minimum. On the positive side, we do know that community Road Safety attitudes can indeed be changed: the wearing of seat belts is an example.

The scan revealed no examples of a whole-of-life approach to Road Safety Education and no examples of the scaffolding approach to education in Road Safety and no references to the concept of scope and sequence. All education systems investigated in this research include Road Safety, but the content and approaches taken are restricted by the outcomes set by the relevant education authorities. It must be noted here that education systems cater only to children of preschool and school age. In Australia, education is currently in a state of flux with the projected introduction of a National Curriculum overseen by ACARA in the coming years and reference materials are being prepared. A scan of material available from state transport authorities revealed some educational

material, but did not sufficiently show educational connections between needs of the various road user groups. An example is the RMS website in NSW where there is greatest emphasis on the driver/rider licensing process.

The research conducted also included a scan of the relevant education theory (4). There have been centuries of educational research on how to structure a learning programme and all current programming seeks to provide a scaffold on which to build a suitable scope for each element and an appropriate sequence for those elements. When the following tables were constructed, the author referred to education theory as a separate concept and then education theory as applied to Road Safety Education. It is widely accepted in the field of child development that the teaching and learning process needs to be well-structured and with clear aims at all times so that the desired outcomes can be achieved. The learner is the central figure and the appropriate balance needs to be struck between theory and practice. Such education theorists as the oft-quoted Piaget who expounded his theory based on stages, Vygotsky with his social and interactive scaffolding and the multiple intelligences of Gardner, lead one to the conclusion that any Road Safety Education programme needs to satisfy the following criteria:

Be soundly based educationally, have the best quality design, be sequentially structured, be learner-centred, be targeted at the learner's current and future needs, be competently delivered, involve on-going evaluation by the mentors and be evaluated for its relevance.

All of these elements need to combine in order to maximize the positive powers of motivation on the part of the mentor and the learner. The concept of education being based on the mentor and the student is being applied to programmes targeted at increasingly younger students. That which used to form the basis of adult education is being used for school-age students. The application of these principles can be seen in the ATSB's document "Development of a Novice Driver Education Curriculum for the ATSB" (5).

As mentioned above, the value of motivation is crucial (6).

One important aspect coming out of this research was the fact that there appears to be a large body of educational research that has not been translated into Road Safety programmes available to parents and caregivers. Government-sponsored websites are an example of this. Also, scope and sequencing in programming is hard to find. There is any number of statements suggesting approaches to Road Safety Education. In the UK assistance for schools (7) and the ACT document (8) p.18 are good examples of suggestions made needing to be translated into usable form.

The outcome of this research has been the development of a whole-of-life programme in Road Safety which takes into account passenger safety, pedestrian safety, cycling safety and driving safety in that order as detailed in table form below. A key concept is that Road Users' needs change with time and the purpose of this programme of learning is to show how Road Safety needs change through childhood into adulthood and later life, ie one step prepares for another.

It is presumed that there is a transfer of Road Safety skills from being a passenger, to being a pedestrian, cyclist and driver. At each stage of learning it is assumed that the learner will progress from total dependence on mentors through to the *possibility* of total independence. The progression along this continuum is for the mentors to assess and each person's needs are different.

It is not presumed that all learners will progress from being a passenger, to being a pedestrian, then cyclist and then driver – it depends on the individual's own personal circumstances.

The result is a learning programme which shows the building blocks of learning about survival on the road. It must be pointed out that the ascending order of complexity of task would be: passenger safety, pedestrian safety, cycling safety, driver safety, adult road user safety.

Towards survival on the road – the programme's section titles:

Towards greater passenger safety
Developing safety skills for pedestrians
Cycling safety
Driving safety and Road Safety for adults
Each section is set out as follows:
ideas covered
key words
progress chart
implications for other sections

The programme:

Section 1 - Towards greater passenger safety

Ideas covered in this section:

Self-preservation: how to maximise your safety

Sitting comfortably

Being helpful: helping the driver concentrate, helping to find the way to where you are going

Caring for yourself and other people: choosing when not to be a passenger in someone's vehicle

Preparing to be a pedestrian:

- being a passenger can teach a lot about the road scene:
learning about road signs, signals and road markings
- distinguishing between left and right
- starting to learn about speed

Key words:

left, restraint system, right, road signs, signals and markings, seat belt, speed

Seat belts:

In order to achieve the maximum safety for passengers seat belts are shown to have best application if:

- the correct type of seat belt is worn
- for infants and children there are special restraint systems and restrictions on where the children are allowed to sit
- for teenage and older, the lap/sash belt
- the seat belt is not twisted and is worn tightly
- each belt is worn by one person per belt
- passengers sit straight - this avoids you slipping under the belt if the vehicle suddenly stops

Which seat to sit in:

- It has been found that where you sit in a vehicle can affect your safety: the back seat is much safer than the front and this is why there are rules regarding children having to sit in the back.
- The front passenger's seat has been called "the death seat" for good reason.

Boarding safely: if possible use a kerbside door to get into a vehicle. It keeps you away from passing traffic.

Alighting safely: if possible get out of the vehicle on the kerbside and check that it is safe to open the door.

Sufficient ventilation: make sure you get as much fresh air as you can. This helps guard against the bad effects of the air inside the vehicle that could be coming from the engine or from other sources.

The interior of a vehicle can easily become so hot on warm days and so cold on cool days that the temperature can kill.

The driver needs to concentrate: driving is a difficult thing to do, so passengers need to allow the driver to put full attention to the task of driving. This might mean not talking to the driver any more than necessary. Good behaviour by children as passengers is especially important.

Road reading: as children learn to read, road signs are very helpful in developing reading skills and recognising colours as well learning where to look to see the important information on signs and signals and road markings. Also learning about the appropriate speed at which to drive. This is good preparation for becoming a pedestrian, cyclist and driver.

Learning to see traffic signals can also help identify any colour “blindness”. Arrows at traffic lights also help distinguish between left and right.

Map reading: it can be very helpful to the driver for passengers to be able to read maps and operate any satnav the vehicle has. As children grow they can be taught how to read a map and operate satnavs.

The driver becomes ill/incapacitated: simply noticing if the driver shows signs of tiredness can save lives, but if the driver suddenly becomes ill while driving it can also save lives if the front seat passenger can steer the vehicle and apply any available brake.

Choosing your driver: passengers should learn when not to get into some people's cars:

- not accept a ride offered by someone you do not know
- not get into a car being driven by an unlicensed driver or by someone not fit to get behind the wheel. This skill can take years to learn.

Handling emergencies:

First aid: the faster that appropriate help is to injured people the better their chances of survival. As children grow they can learn the basics of First Aid. First Aid organisations can help with information.

Ambulance, fire, police: knowing how to contact the emergency services is a high priority. This can save lives. Children should learn the number needed to call the local emergency services. A different number used only on mobile telephone networks is also useful.

Progress chart:

Concepts	Item demonstrated/shown how to do and has been practised please tick	Can carry out this skill reliably please tick
Getting in and out using the kerbside door wherever possible		
Appropriate child restraint properly installed and worn		
seat belt correctly worn		
Getting enough fresh air guarding against excessive heat and cold		
Helping the driver concentrate on driving		
Learning about traffic signs and signals		
Recognising road markings		
Reading a map		
Operate a satnav		
Stranger danger – not getting into a stranger's vehicle		
Knowing how to call emergency services		

Advanced skills:

Concepts	Item demonstrated/shown how to do and has been practised	Can carry out this skill reliably
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	please tick	please tick
What you can do if your driver suddenly becomes ill while driving		
Choosing when not to get into a vehicle eg if the driver has been drinking, is suffering fatigue or is unlicensed		
Knowing how to apply First Aid		
How to manage a crash scene		

Passenger safety on public transport

Being a passenger in public transport such as trains and buses involves many of the ideas that apply to being a passenger in a car:

- Getting on and off in the safest way. It is no accident that bus doors open out onto the kerb side of the road.
- Allowing the driver to concentrate on driving
- A passenger sitting down is much safer than one standing
- Observing the road can be practised from a passenger's seat
- Knowing how to call emergency services can be critical in an emergency

Section 2 - Developing safety skills for pedestrians

There is much to learn about when becoming a pedestrian on and near roads.

There are skills to be mastered:

- There are more complicated decisions to be made and a pedestrian is very exposed to danger and injury.
- Being a person on foot using footpaths or walking at the edge of the road if there is no footpath, is the first step towards coming face-to-face with vehicles that are moving. When walking in a parking area vehicles can come from many more directions.
- Pedestrians are almost at all time in harm's way.
- There are complicated decisions to be made and these are badly-handled by children: their senses – eyes and ears especially are not mature enough to handle traffic.

Children need to be closely supervised and their hand held until they can do the following:

- understand left from right
- distinguish between things that are in front of them from things that are behind them
- understand where the footpath finishes and the roadway starts
- tell the difference between things that are getting closer and those going away from them
- apply the ideas of “fast” and “slow”
- understand “near” and “far”
- distinguish between seeing and being seen
- concentrate all the way from one side of the road to the other
- reliably apply a kerb drill – stop, look, listen, think
- reliably find the safest place to cross and avoiding the most dangerous places to stand

With time and practice come the need to better understand:

- the surfaces we walk on: some are slippery even when they are dry
- judging speed – the better you can judge the speed of vehicles the better you will be prepared for being on wheels
- judging distance – this goes hand-in-hand with judging speed
- daytime/shadows/night time – daylight gives good vision but as it gets darker people and things become harder and sometimes impossible to see.
- Clothing – the brighter it is the easier it is for you to be seen. Wearing dark clothing at night makes it hard for you to be seen.

- The weather does make a significant difference: wet, dry, icy, foggy – each presents its own problems.

It is a proven fact that most injuries for people on foot involve slips, trips and falls.

Ideas covered in this section:

Self-preservation, Caring for yourself and other people, Being in harm's way

Key words:

classes of roads, common driving errors, driveway, emergency services, first aid, footpath, intersections, left, kerb, parking area, pedestrian, pedestrian crossings, right, road signs, signals and markings, slippery, speed, surface, vehicle colours, vehicle shapes, vehicle sizes

The safety factors you understand as a pedestrian and skills you use when you are on foot help prepare you for understanding cycling.

Pedestrian Safety - Progress chart

Concepts	Item demonstrated/shown how to do and has been practised please tick	Can carry out this skill reliably please tick
Holding an adult's hand		
Walking on a footpath		
Surfaces we walk on – when they are slippery and when they are not		
Watching out for vehicles crossing the footpath		
Where to walk when there is no footpath		
Walking in parking areas		
Kerbside drill when not near an intersection – stop, look, listen, think		
Kerbside drill when at different types of intersections – stop, look in all directions that traffic comes from, listen, think		
Knowing what speeds to expect on any given stretch of road		
Fast speeds and slow speeds		
Deciding what is near and what is far away		
Left and right		
Obeying traffic patrol and police officers		
Knowing the meaning and use of traffic signals for pedestrians		
Making sure you can see any approaching traffic and that the drivers can see you		
Wearing clothes that help you to be seen		
Finding appropriate places to cross roads		

Identifying vehicle sizes and their ability to stop		
Being a pedestrian at night		
Roads where pedestrians are not allowed to go eg freeways		
Identifying mistakes commonly made by drivers		
How to call emergency services		
Giving first aid		

Section 3 - Cycling safety

Many of the concepts needed for being as safe as possible as a pedestrian apply to cycling:

- Self-preservation
- Caring for yourself and other people
- being in harm's way
- Cycling should first be practised on quiet roads and busy roads should be avoided until the cyclist is mature enough to handle being in traffic.

Key ideas needed for pedestrian safety also relate closely to cycling safely:

- the dangers presented by driveways and doors being opened unsafely
- the use of emergency services
- knowing first aid
- footpaths
- left and right
- the dangers presented by kerbs and drains
- pedestrian crossings
- the need to recognise slippery surfaces
- judging speed

key words for cycling safety:

bicycle, blind spot, brakes, chain, cushion of safety, hand signals, helmet, lights and reflectors, nuts and bolts, road rules, roundabouts, tyres

The issues raised in the cycling safety section also apply to motorcycling.

There is also a note at the end of the section on driving safety referring to motorcycling.

It should also be remembered that these concepts and more also relate to driving.

Cycling safety progress chart

Concepts	Item demonstrated/shown how to do and has been practised	Issue discussed or solved/can carry out this skill reliably please tick
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	please tick	
Ride a bicycle of the correct size and type		
Wear a helmet correctly		
Wear suitable bright clothing and protective footwear		
Make sure the brakes and bell are working		
Check the tyres have enough air in them and are in good condition		
Check that the chain is not too loose or too tight		
Check that the seat is correctly adjusted and not loose		
Check for any loose nuts and bolts		
Do not ride a bicycle that is in an unsafe condition – also check lights if riding at night		
Look up and learn the road rules		
Getting on the bicycle and moving off		
Practise stopping on varying road surfaces		
Practise riding in a straight line		
Practise using eyes and ears: see road signs and markings and other road users hear other vehicles		
Learn what a blind spot is and avoid being in a blind spot especially around trucks and buses		
Keep a cushion of safety around you		
Left turns		
Right turns		
Give hand signals		
Practise small roundabouts		
Learn about patterns in traffic movement		
Identify common mistakes made by other road users in the areas where it is intended to ride: travelling too fast failing to give signals failing to see cyclists car doors being opened unsafely and so on		
Practise riding in traffic when ready		
Practise busy roundabouts		
Identify places where it unsafe or it is forbidden to ride		
First Aid		

Section 4 - Driving safety

Driving according to the prevailing conditions with maximum safety margins is the aim. It is often called “defensive driving” which aims to allow the driver to be as fully aware as possible of how to avoid making driving errors and as much not become a victim of the mistakes that other road users make.

key words:

defensive driving, deportment, emergencies, maintenance, money management, overtake, road rage, road rules, towing

Driving safety progress chart

Concepts	Item discussed/demonstrated/shown how to do and has been practised please tick	Issue discussed or solved/can carry out this skill reliably please tick
Study the road rules for drivers		
Get the necessary licence		
Controlling your emotions including anger, frustration, impatience		
Visual check of the vehicle before getting in: tyres and leaks of fluids Check there are no obstructions such as toys or children		
Getting a comfortable driving position, attaching the seat belt including passengers adjusting the mirrors securing any loose objects		
Finding all the controls and driver aids checking that all windows are clear and that there is enough fresh air		
Making sure you are fit to drive: alert, not tired, not under the influence of alcohol or a drug		
Making sure that your hearing is not affected by a sound system that is too loud		
Starting the engine safely		
Moving off smoothly		
Stopping smoothly		
Checking the mirrors, signalling and checking the blind spots before moving off		
Changing gears (manual gearbox)		
Reversing, checking all relevant directions and blind spots		

Practise stopping quickly from a low speed on varying road surfaces		
Practise steering and positioning as far left as practicable		
Practise seeing road signs and signals		
Practise turning left		
Practise turning right		
Practise small roundabouts		
Gradual introduction to traffic		
Blind spots around differing sizes and shapes of vehicle		
Practise following distances 3 second rule		
Practise U turns		
Practise 3 point turns		
Practise parking: reverse parking and angle parking		
Practise larger roundabouts		
Practise smooth cornering		
Practise driving downhill		
Practise driving in laned traffic and lane changing		
Experience being overtaken		
Experience overtaking another vehicle		
Observe common mistakes made by other road users		
Dealing with road rage		
Experience night driving		
Experience varying weather conditions		
Think about common driving emergencies: breakdown, run out of fuel, filling with the wrong fuel flat tyre, flat battery, floodwater bushfire		
Learn how to fuel up, check oil levels, windscreen washer level, coolant level check horn and all lights are working		
Learn how to change a wheel		
Observe towing difficulties		
Learn about maintenance schedules and repairs best left to a qualified mechanic		
Learn about fixed running costs: registration, compulsory insurance and motor vehicle insurance		

Driving gently to reduce fuel consumption		
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This section has a close relationship to motorcycle riding and should be read in conjunction with cycling to enhance the learning about motorcycling.

Section 5 - Road Safety for adults

Background information for the adult stage:

- We can learn much from the mistakes of others.
- The development of new technology brings the need for understanding and adaptation.
- Inappropriate road –related habits need to be identified and rectified.
- We encounter emergency situations - some are common, some not.
- Pre-thinking how to handle common emergencies can save lives – a child in a locked vehicle, disobedience of traffic control signals, being tailgated, skids, impending hit from the rear and so on are simple examples.
- We age and this has consequences for Road Safety.
- Our needs and circumstances change needing us to gain new knowledge and skills.
- Complacency is natural for humans and it needs to be well-appreciated and counteracted.
- Laws change and we have the responsibility to keep up with the changes and to obey and understand the rules and their aims can help safety levels.

Road Safety for Adults – an overview

Concepts	Useful sources of help/information
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Keeping a check on your health as a driver	Be aware of any changes to your own vision, hearing and ability to handle traffic. See your doctor, optometrist and any other specialist as necessary.
Keeping up-to-date with First Aid	Do a course with a recognised First Aid organisation.
Sitting comfortably in the driver's seat	Refer to your vehicle's operator manual.
Getting to know an unfamiliar vehicle – under the bonnet and from behind the wheel	Refer to your vehicle's operator manual, dealer and motoring organisation.
Making sure all passengers are properly belted and comfortable	Check that belts are being worn. Check with your government authorities and motoring organisation for the latest information on seat belts.
Using a vehicle of the appropriate size	Consider what your needs are and check what vehicles are available when buying or renting.
Making sure the vehicle is serviced according to the maker's schedule and that all systems and lights are working	Refer to your vehicle's operator manual and dealer/repairer.
Regularly keeping up-to-date with the road rules and the reasons for the rules	Refer to the website of your government authority.
Using your experiences as a road user to help avoid crashing	
Setting a good example to other road users	Monitor the behaviour and attitudes of other people and your own and the effects they have on young road users.
Choosing the best transport alternative for each journey	Be aware of the balance between public and private transport.
Adapting to unfamiliar conditions: long journeys needing rest periods driving in remote areas ice and snow left/right hand drive and so on	Refer to the website of the local government authority where you intend travelling. Your local motoring organisation can also help. Be prepared to learn.
Learning how to tow a trailer/caravan	Refer to training organisations that conduct specialised courses.
Upgrading your licence to another category – learning new rules and practising new driving skills	Refer to the website of your local government authority.

Conclusion

Learning is a lifelong pursuit driven by our ever-changing needs and circumstances. Knowing how to best prepare ourselves for road use is a never-ending challenge. Review of the currently available educational theory and the application of it to Road Safety Education revealed the need to develop a whole-of-life approach that could be put into practice by parents, caregivers and educationalists.

Online resources

- 1 <http://www.oecd.org/dataoecd/14/58/31950392.pdf> : OECD promotes the value of whole-of life concept
- 2 http://www.rospa.com/roadsafety/info/making_it_count.pdf : RoSPA explores the importance of the cost of education
- 3 <http://www.det.wa.edu.au/sdera/detcms/navigation/for-schools/about-sdera/evaluation/> : DETWA references the evaluation process
- 4 <http://siteresources.worldbank.org/EXTROADSAFETY/Resources/childdev14.pdf> : World Bank references education theory
- 5 <http://www.atsb.gov.au/pdfs/cr222.pdf> : ATSB explains the mentoring process
- 6 http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VN8-460MBM3-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=f777c2c789568c0b2945502c4807a418 : Science Direct explores the role of motivation
- 7 http://www.dft.gov.uk/think/education/early-years-and-primary/docs/booklet_senior_managers.pdf : DfT UK – an example of theory needing to be translated into practice
- 8 http://www.tams.act.gov.au/_data/assets/pdf_file/0009/236772/ACT_Road_Safety_Strategy_2011-2020.pdf : TAMS ACT – a further example of theory needing to be translated into practice

Recommended further reading

School Road Safety Education support documents:

DETWA:

<http://www.det.wa.edu.au/sdera/detcms/navigation/for-schools/about-sdera/research/?oid=MultiPartArticle-id-8976787>

<http://www.det.wa.edu.au/sdera/detcms/primary-and-early-childhood/sdera/resource/principles-for-road-safety/principles-for-school-road-safety-education.en?oid=com.arsdigita.cms.contenttypes.FileStorageItem-id-4512193>

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