

Driver training in steps (DTS)

Summary

For some years now, the Netherlands has had a Driver Training in Steps (DTS) as well as the regular driver training. The DTS is a structured education with clear training objectives which are categorized in four modules. Although the DTS is considerably better than the traditional driver training from a didactic point of view, its extra road safety value is difficult to show at the moment because there have not yet been any large scale crash studies. There should also be a note of caution regarding the effect of self-selection when choosing a driving course, and the very slight differences with the regular course at the behavioural level. If the DTS were to be combined with a graduated driving licence, i.e. a learning period in which novice drivers are allowed to participate in traffic in phases, it could then have a positive road safety effect for novice motorists.

Background

In the Netherlands there are no legal requirements with regard to the type and contents of the driving course. However, the driving instructors must be qualified and the learner car must have dual controls. Traditionally, learner drivers have a driving lesson of about one hour, once or twice a week, for a period of between several months and more than one year, until the instructor thinks that the learner has sufficient skills to pass the driving test. This traditional driving course does not usually have a formal curriculum or a fixed method. For a few years now a driver training course is being offered that does have a clear structure: it is called the Driver Training in Steps (DTS).

What is the DTS?

The DTS differs from the traditional course in a number of ways. The goal of the DTS is safe traffic participation, and it also includes topics which are not examined in the driving test. For example, on a special driver training circuit learner drivers have to experience what it feels like to skid in order to make them realize how little control of the vehicle they then have. Hopefully this experience teaches novice drivers to avoid circumstances in which they can skid. Experiencing hazardous situations, however, is not a compulsory part of the DTS and some of the DTS certified driving schools have not included it in their curriculum. The DTS is also meant to train learners in finding a solution on their own for every problem they may encounter in traffic. The DTS has clear training objectives which are clustered in four modules that rank from simple to difficult:

Module 1: vehicle operation and vehicle control;

Module 2: mastering simple vehicle manoeuvres and traffic situations;

Module 3: complex vehicle operation, and control of complex traffic manoeuvres and situations;

Module 4: safe and responsible traffic participation.

A new module may only be started when a test has shown that the learner has mastered the training objectives of the previous module. Modules 1 and 2 are tested together by the driving instructor in a partial test. Module 3, which is also a partial test, is examined by an examiner of The Dutch Driving Test Organisation. The final test is the regular driving exam. The lessons work with what are known as scripts. They contain the crux of the procedure to deal with certain traffic tasks. For example, the text of the script for viewing behaviour is "Look two hundred metres ahead, don't stare at one point, look in the inside mirror, look in front of the car, look in the outside mirror/mirrors". When learning a traffic task, the learner begins with applying the script under simple conditions. The learner then has to gradually learn how to use these scripts in more complicated circumstances. What is different from the ordinary driver training is that the progress of the DTS learners is systematically tested by asking them to carry out certain specific tasks which are registered in a course file. Not all driving instructors may use the DTS method; a certified instructor has to follow an additional 6 day course. DTS instructors have to follow an application course every year to remain a certified instructor.

What is the difference between DTS and the graduated driving licence?

The DTS is often confused with the *graduated driving licence*. The graduated driving licence however, refers to a phased entry to the road as motorist. During the first phase, only accompanied driving is

permitted. During the second phase, solo driving is permitted but not under circumstances which are particularly dangerous, e.g. not during hours of darkness, not with passengers of the same age, and not after having drunk alcohol. The third phase is that of possessing a full driving licence. However, also at that phase there are some limitations for novices, e.g. a lower alcohol limit, and there are heavier punishments e.g. a severer demerit points system. A graduated licence in fact involves a long learning course with short periods of explicit learning alternating with long periods of implicit learning, and in which gradually more is permitted (see the SWOV Fact sheet [Graduated driving licence](#)). The DTS only uses explicit learning. It is a curriculum and a method for driving lessons being taught by a driving instructor. Within the DTS it is possible to follow a compact course of several days; this is unthinkable in the graduated driving licence.

How can we determine the safety value of a driver training course?

The DTS aims to be more than an efficient method of obtaining a driving licence. It is also about safe and responsible traffic participation for novice motorists, which should help their high crash rate to decline (see the SWOV Fact sheet [Young novice drivers](#)). Measuring the safety value of a driving course can be done in four different ways:

Course contents

The contents of a driver training is itself an indication of its quality. A good driver training teaches those skills and insights that are essential for safe traffic behaviour. What these are exactly can be determined by looking at the experienced motorists' skills, at the causes of crashes involving novices, and at those components of the driving task that need to be carried out perfectly because of their strong relation with crashes. On the basis of these analyses it can be determined what exactly a novice must know and be able to do. A good driver training ensures that novices achieve these training objectives. The didactic approach is also important, as well as the contents. The way in which the training objectives are achieved also influences, for example, the retention and transfer of skills.

Pass rate

The pass rate is only an indication of the safety value of a driving course if the driving test is *valid*, i.e. if there is a strong relation between the scores of the driving test and the crash rate in the first years after passing the driving test. The validity of a driving test is awkward to determine because those who fail the test are not permitted on the road. The other possibility is to see if there is a difference in crash rate between those who only just pass the test and those who do so by a wide margin. Research abroad (Senserrick & Haworth, 2005) has shown that the relation between the driving test results and the crash rate is weak. We do not know whether the Dutch driving test is valid or not. Data from the *Periodic Regional Road Safety Survey (PRSS) 2004/2005* (Hazevoet & Vissers, 2005) shows that males need a significantly lower average number of driving lessons to pass the driving test than females; 41.4 hours and 47.6 hours respectively. Also, the younger one is, the fewer driving lessons are needed to pass the test. However, young males have by far the highest crash rate after getting their driving licence (see the SWOV Fact sheet [Young novice drivers](#)). This is an indication that the Netherlands driving test may not be very valid.

Crash involvement

If, after obtaining their driving licence, those who followed course X and are less often involved in crashes than those who followed course Y, we can conclude that the safety value of course X is higher than that of course Y. However, studies of crash involvement are rare. This is not surprising because an evaluation study requires very many subjects, i.e. thousands of novices. After all, crashes are rare events which are, to a large extent, determined by chance. In other words, crash involvement research is difficult to carry out and is very time consuming.

Safe behaviour

It is also possible to examine whether, after getting their driving licence, novice motorists who followed course X behave better or worse in traffic than those who followed course Y. Such a study requires a clear relation between certain behaviour and crash rate. A great deal of research into this has been carried out and clear relations have been identified. The advantage of behavioural research is that it requires much smaller groups than crash involvement research.

A problem with all these studies into the road safety effects of a particular driver training is the fact that learner drivers themselves choose a certain driver training type. If for example only learner drivers with a high safety awareness were to choose a DTS, then any differences in pass rate, behaviour, or crash

involvement are not only explained by having followed a DTS but also by their personal characteristics. This phenomenon is known as self-selection. To exclude this phenomenon, learner drivers for an evaluation study would need to be randomly allocated to a DTS or a traditional driver training. As the Netherlands has freedom of education, such a random study is impossible. To examine whether self-selection has played a role, we could examine if there are differences in personal characteristics between those who choose a DTS and those who choose a traditional driving course.

Before an educational measure is introduced on a large scale, the effectiveness of this measure must have already been determined, at least at the level of contents and behaviour. Once the educational measure has been broadly introduced, its effectiveness should be tested at the level of crash involvement.

What is known about the safety value of the DTS?

Course contents

The final report of the European BASIC project about driver training models (Hatakka et al., 2004) describes the ideal driver training as:

- having clear learning objectives and contents;
- giving enough feedback to improve behaviour and to learn;
- theoretical and practical training supporting each other;
- offering the possibility to gain enough experience*;
- provide a realistic environment to practice the necessary skills;
- having a learning period which is long enough to let the skills and knowledge take root, and a learning climate which focusses on safe traffic behaviour*.

It recommends the following:

- structuralize the driver training and phase it from easy to difficult;
- alternate the periods of formal training with periods of accompanied driving (introduce a graduated driving licence)*;
- improve the quality of the driving instructors;
- structuralize and monitor the periods of accompanied driving*;
- spread the driving licence over the various parts of the graduated driving licence*.

The DTS meets most of the criteria and recommendations formulated by the BASIC project, but not those marked with * and which are inherent in a graduated driving licence.

An important conclusion of the BASIC project is that, in reference to the Goals of Driver Education (GDE) matrix (Siegrist, 1999), the driver training should contain more than vehicle control and regular traffic participation. A simplified version of the GDE matrix is given in *Table 2*. The GDE matrix has been developed based on knowledge about the causes of the high crash rate of young novice motorists. The rows of the matrix give the various levels at which the driving task is carried out, and the columns give the essential factors that determine the quality of motorists. In Europe, the GDE matrix is increasingly being used as criterion for what a driving training course needs to contain. The DTS teaches more than the skills in the four boldly boxed cells which the traditional driver trainings usually limit themselves to. However, the DTS still pays relatively little attention to the knowledge and skills that are mentioned in the Introspection column and the Norms and Values row.

Behavioural level	Knowledge and skills	Risk-increasing factors	Introspection
Norms and values	Lifestyle, controlled behaviour	Risk acceptance	Level of moral development, self-knowledge
Planning of traffic participation	Route choice, mode of transport	Ensuring fitness to drive (not tired, no drink driving, etc.)	Self-estimation
Traffic participation	Diagnosis and prediction of traffic situations	Risk perception	Fitting traffic task to task competence
Vehicle control	Steering, braking, etc.	No automatic task performance (one needs to think too much about performing basic skills)	Judgement of one's own vehicle control

Table 1. Goals of Driver Education (GDE) matrix (from Siegrist, 1999).

Pass rate

In the Dutch province of Gelderland in 2001, a small scale test with the DTS took place (Nägele & Vissers, 2001). For the 109 DTS learners, the pass rate on their first driving test was 83%. In the period immediately before the DTS was introduced, the pass rate for the regular learners at the same driving schools was 46%. In addition, the DTS learners had not needed more lessons than the group of regular learners with the 46% pass rate. From January 2002 to April 2003, a large scale follow-up study was done in Gelderland in which 557 DTS learners participated. In this study their pass rate was 75% compared to 53% for the regular driver training given by driving schools involved in this second DTS test. This time, the number of driving lessons of the DTS learners was slightly larger than of those who followed the traditional course, but the difference was not significant (Nägele & Vissers, 2003). In addition to the pass rate of this second DTS evaluation, the quality of the learners during the practical exam was analyzed. For four skills a score of from 1 to 10 was awarded:

- technical handling of the vehicle;
- traffic insight;
- application of traffic rules;
- using 'The new driving force', a new, more cost-effective and environment-friendly style of driving.

On all four skills the DTS learners achieved significantly higher scores than regular learners. It should be noted that the examiners knew beforehand which learners had followed the DTS and which had not. This may have influenced their judgement.

Without a doubt, the DTS has a high pass rate. However, this possibly is not so much the effect of the DTS, but could be caused by learners who chose DTS having other qualities than those who did not. This has already been discussed in the passage about self-selection. The choice for the DTS is probably made more consciously than the choice for the traditional driving course. This was examined briefly in both the assessment studies of (Nägele & Vissers, 2001; 2003) as well as in the PRRSS (Hazevoet & Vissers, 2004). Some small differences in sex, age, and education level were found, but these differences were not the same in either of the assessment studies and in the PRRSS. It may be concluded that the aspect of self-selection has not been sufficiently studied to determine whether it has an influence on the pass rate.

Besides possible self-selection, there is still the fact that the driving test is a selection instrument. Only those who pass the test are allowed to drive on the roads. Ultimately, everybody must meet the same standard. The pass rate on its own can not determine whether the safety value of a driving course is high.

Are DTS learners safer drivers after having passed their driving test?

The most recent study of the DTS was an assessment based on a test drive (Vissers et al., 2004). This test drive was part of a study into the effect of a refresher course after having been in the possession of the driving licence for about *six months*. The course participants had been both DTS learners as well as non-DTS learners. The non-DTS learners probably mainly followed the traditional course, but a more or less structured course different from the DTS, or a compact course, are other possibilities. The examiners who supervised these test drives did not know which type of driver training the participants had followed. The skills which the examiners assessed during the test drives at the beginning of the refresher course are given in *Table 2*.

In *Table 2* it is striking that the DTS group performed better than the non-DTS group in 17 of the 20 skills. However, the differences are generally rather small, and were significant in only 3 of the 17 skills. There is an easy explanation for the fact that the DTS group drives considerably more economical than the non-DTS group. From the very first lesson of the DTS, the new driving style 'The new driving force' is taught, but this is very rarely done in the traditional course. The clearly better vehicle operating of the DTS group may be due to the fact that the DTS learner can only start practicing traffic situations once vehicle operation has been mastered. The use of scripts possibly also plays a role here. Working with clear procedures could result in reaching the level of automatism sooner. It is strange that the DTS group anticipates significantly better, but is hardly any better in risk awareness, hazard perception, and traffic insight. The question remains how well driving examiners can assess the higher order skills such as defensive driving, hazard perception, and risk awareness. They do not have to explicitly examine learners on these aspects in the regular driving test. It may be the case that the reliability of the expert judgements of higher order skills leaves to be desired.

Subject	Score	Subject	Score
Journey preparation and journey end	-	Adapted and decisive driving: speed	+
Vehicle operation	+*	Adapted and decisive driving: determined actions	+
Vehicle control	+	Driving on straight and bendy roads	-
Driving economically (The New Driving Force)	+*	Behaviour at intersections	-
Solo driving	+	Behaviour when turning off	+
Social traffic behaviour	+	Merging and exiting	+
Defensive driving behaviour: anticipating	+*	Overtaking and passing	+
Defensive driving behaviour: effective scanning	+	Oncoming traffic and being overtaken	+
Defensive driving behaviour: safety margin and headway distance	+	Changing lanes and moving sideways	+
Risk awareness, hazard perception, and traffic insight	+	Driving on unusual road sections	+
+* statistically significant ($p < 0,05$); + RIS better; - RIS not better			

Table 2. Results of RIS judgement journeys v. regular driver training (from Vissers et al., 2004).

Is the safety value of the DTS higher than that of the traditional driver training?

The DTS looks good with regard to contents and its high pass rate, when compared with the traditional course. Although it is too early for the indisputable conclusion that the DTS has a higher safety value than the traditional course, the expectation is justified. The traffic behaviour of novice DTS motorists six months after having passed the driving test is somewhat better on many aspects, than that of non-DTS learners, and even is significantly better on three points. However, even this difference in behaviour cannot lead to the conclusion that the DTS has a higher safety value than the traditional course. After all, the learners themselves have made the choice between the DTS and the traditional course; the effect of self-selection mentioned earlier. The learner who chooses DTS may be a learner who has other qualities than the learner who chooses the traditional course. This could explain the difference in behaviour.

Conclusion

More so than the regular course, the DTS is based on training objectives that are directly related to road safety. Although it is unknown how systematically these training objectives are followed by the DTS qualified driving schools, this driver training may be assumed to contain more safety related components than the average regular driving course. DTS learners having a higher pass rate does not say much about the safety that can be expected from this group. The fact that six months after the driving test the DTS learners on average perform better than non-DTS learners, is a better indication that the DTS is a step in the right direction. However, this conclusion must be drawn carefully, because it is still possible that this is the result of self-selection and because the differences are very small. A more accurate method of measuring the higher order skills, as well as a random selection of DTS or non-DTS learners, must make it possible to make clear statements with regard to the behavioural level about the safety value of the DTS. Now that the DTS is being used widely, its safety value can be determined on the basis of crash involvement. However, this is a large and complex topic to study, and in addition it is difficult to exclude the effect of self-selection.

Seen from an educational perspective, the DTS is considerably better than the traditional course. That is why it is rather disappointing that, although the DTS scores higher than the non-DTS on 17 of the 20 subjects at the behavioural level, only three of the scores are significantly higher. From educational psychology it is known that skills only really take root after there has been a lot of experience under varying conditions. It could be possible that the DTS learning period is too short for its advantages to show clearly. If the DTS were linked to a graduated driving licence system, the DTS advantages could possibly be demonstrated better, and all the criteria and recommendations of the European BASIC project could be met.

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