

The optimised driver training in Germany

– combining theory, practice, blended learning
and learning progress assessment

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Basic positions

The driver training in the System of Novice Driver Preparation

- **Novice Driver Preparation should be seen as an educational system!**
- **Driver training should be based on a competency framework with minimum training contents, on a binding educational plan and on a blended learning concept!**
- **The Catalogue of Driving Tasks should be the conjunctive „hinge“ between the driver training and the (theoretical and practical) driving test!**

The driver training in Germany

Need for optimisation since it's last reform in 1998

- **Key points of criticism on driver training:**

- Outdated contents and insufficient linkage between theory and practice¹
- Lack of curricular foundations (e. g. minimum training contents, sequence)^{1,2}
- „Paternoster“-system for theory classes³
- Unsufficient learning level assessment and assessment for „Exam maturity“⁴
- Developable paedagogical-didactic teaching competence of driving instructors³
- Lack of terminological and structural references between legally anchored contents of driver training and driver testing¹
- Missing quality assurance of teaching-learning media³

¹BAST Expertengruppe „Fahranfängervorbereitung“ (2012); ²Bönninger & Sturzbecher (2005); ³v. Bressensdorf (2001); ⁴Friedrich, Brünken, Debus, Leutner & Müller (2006)

Steps to optimise driver training

Project order of the Federal Highway Research Institute (BASt)

1. „Approaches for the optimisation of driver training“ (2012 – 2013; IFK)

- Specification of general professional requirement criteria for elaborated curricula
- Analyses of demanding driver training curricula from the international field (expert surveys, document analyses)
- Recommendations for the design of a future training course including "traditional" as well as informal and technology-supported forms of teaching and learning

2. „Training and evaluation concept for the optimisation of driver training“ (2019 – 2021; IFK and Saarland University, UdS)

- **“Current state analysis” of driver training by means of literature analyses and secondary data (IFK)**
- **Development of a training concept for class B driver training (IFK)**
- Development of quality criteria for the evaluation of teaching-learning media in driver training (UdS)
- Development of an implementation strategy and an evaluation concept (UdS)

What do we know about driver training?

Current state analysis and conclusions about theory classes

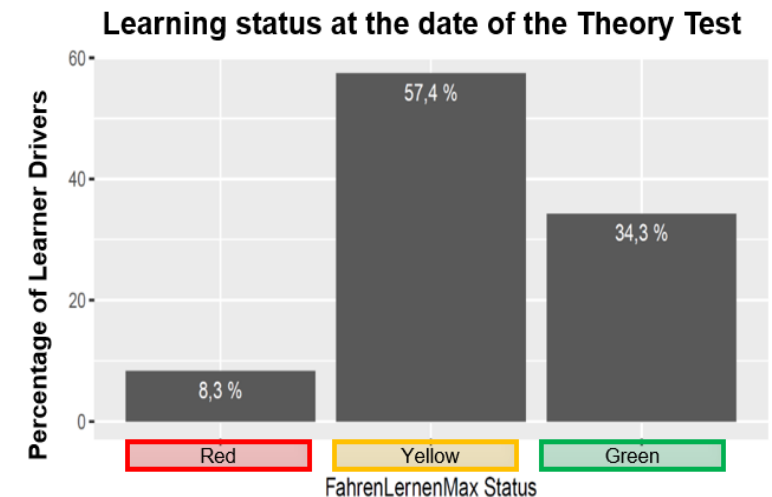
- **In theory classes, learner drivers complete the total amount of prescribed lessons (12 for basic content + 2 for class B specific content). But:**
 - Certain lessons are taken more than once, others are omitted.
 - 60 percent of learner drivers do not attend all 12 different lessons of the basic content.
- **The completeness of the learned content (i.e. omitted lessons or not) influences the success in the Theory Test:**
 - The probability of passing (predicted by logistic regression) differs by about 5 percent between learners who completely vs. incompletely attended the basic content lessons.

Thesis: A justified step-by-step build-up of competencies can be promoted by a "course system" that is binding in terms of content.

What do we know about driver training?

Current state analysis and conclusions about independent theory learning

- **The “learning status” achieved is predictive of success in the Theory Test:**
 - The predicted probability of passing is 95.4 percent for “Green” learning status, 77.7 percent for “Yellow”, and 39.3 percent for “Red”.
- **The learning progress is poorly tracked by driving instructors:**
 - When taking the first Theory Test, only about 1/3 of the learner drivers had achieved a sufficient “learning status” in the previous independent test preparation.



Thesis: The constant monitoring of learning progress is an original (driving) instructor task and must be better supported by providing appropriate methods and instruments.

What do we know about driver training?

Current state analysis and conclusions about practical driving lessons

- **The driving instructor is obliged to document the level of training and the contents trained:**
 - Mainly paper-based instruments are used; i.e. there is hardly any data on the specific contents and their average duration.
 - However, digital applications are available and are gaining in importance.
- **The scope of training ranges from 28 (Q1) to 43 (Q4) driving lessons:**
 - On median, learner drivers need 35 driving lessons to pass the 1st Practical Driving Test.
- **About 30 percent of learner drivers start practical training after the Theory Test:**
 - i.e. no interlock between theory classes and practical driving lessons!



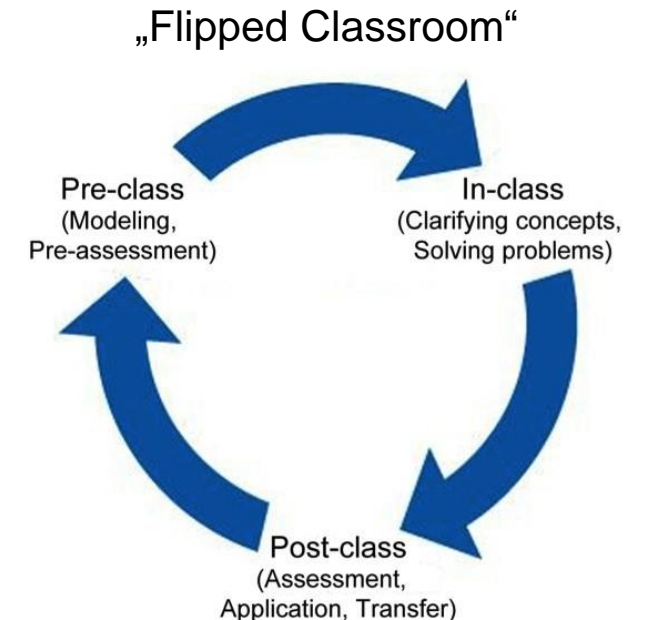
Thesis: A closer integration of “theory” and “practice” can increase the learning effectiveness of driver training.

The architecture of the new driver training

The “Flipped Classroom” as suitable concept for the needs of the target group

- **To address the different individual learning preconditions of the learner drivers, a blended learning concept is needed with ...**
 - independent (asynchronous) e-learning for preparation and follow-up of contents; extension of learning time,
 - degrees of freedom for the learners regarding place, time and speed of learning; support for lower-performing learners,
 - application and consolidation of contents through interactive teaching-learning methods in classroom learning,
 - structuring of the learning process by the teacher by means of learning objectives and learning level assessments.

Thesis: The potential of digital media lies in supplementing (not replacing) traditional instructional arrangements!



Design of „Flipped Classroom“-Models (Estes et al., 2014)

The architecture of the new driver training

Competence framework (driving licence class B)

	Areas of competence (24 competences with minimum training content)
Basic content for all classes	Competence area "Traffic behaviour" System of novice driver preparation and lifelong learning; fitness to drive, driving ability and driving behaviour; diversity in road traffic; basics of driving tasks and basic driving tasks; responsible behaviour in road traffic; driving competence deficits and accidents; environmentally friendly driving and traffic behaviour; behaviour in special traffic situations, in traffic accidents and during traffic controls
	Competence area „Law“ Traffic law regulations
	Competence area „Technology“ Driver assistance systems and automated driving
Class-specific content for Class B	Competence area "Traffic behaviour" Traffic perception and hazard avoidance; vehicle handling; driving straight ahead; cornering; crossing, merging, entering; roundabout; passing, overtaking; rail traffic; stop, pedestrian crossing; entering and leaving lanes, changing lanes; basic driving tasks
	Competence area „Technology“ Technical basics; driving physics
	Competence area "Exam preparation" Exam preparation

4 areas of competence:

- (1) Traffic behaviour
- (2) Law
- (3) Technology
- (4) Exam preparation

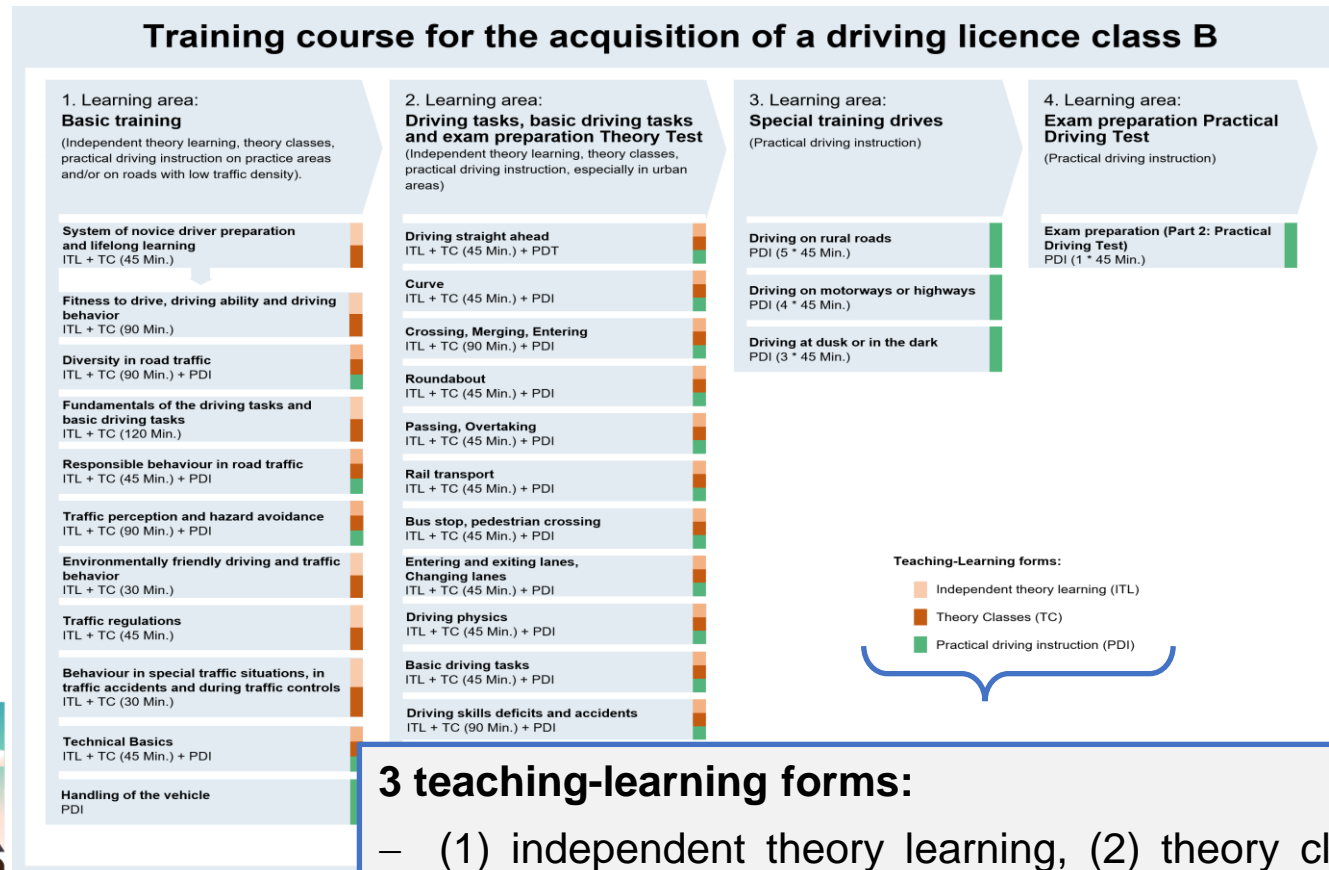
24 competences:

- 10 in the basic contents
- 14 in class specific contents

3 levels of competence: 1. Knowing; 2. Applying; 3. Transferring and evaluating

The architecture of the new driver training

Training course (driving licence class B)



4 learning areas:

- Compulsory sequence from 1 to 4
- (largely) variable sequence within the areas

28 training units:

- Minimum training content to be achieved
- Interlock of theory and practice (through “driving tasks” of the Practical Driving Test).
- “Flipped classroom” approach

3 teaching-learning forms:

- (1) independent theory learning, (2) theory classes (in presence) and (3) practical driving instruction

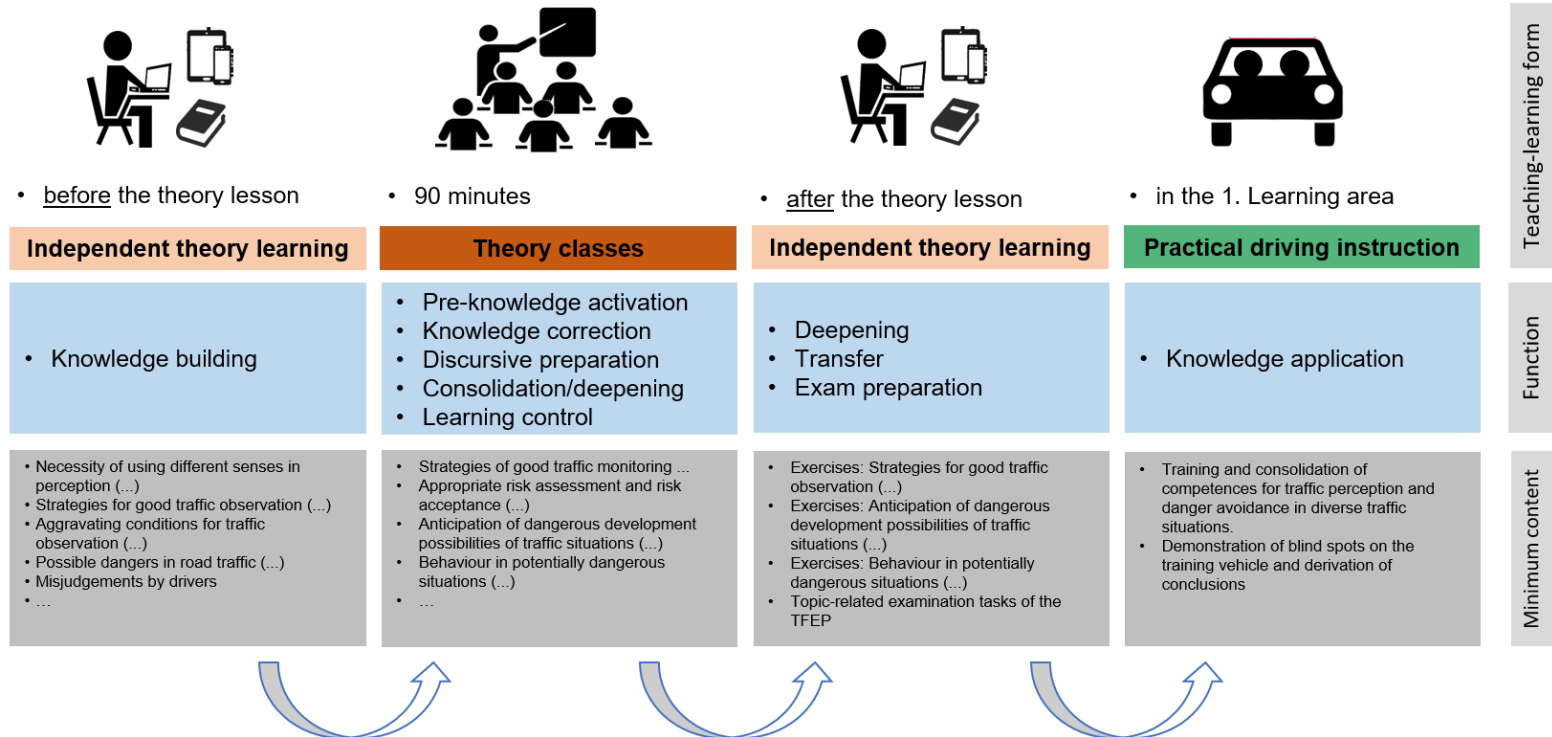
The architecture of the new driver training

Example: Competence “Traffic Awareness and Hazard Avoidance”

1. Learning area:
Basic training
(Independent theory learning, theory lessons, practical driving training on practice areas and/or on roads with low traffic density).

- System of novice driver preparation and lifelong learning
ITL + TL (45 Min.)
- Fitness to drive, driving ability and driving behavior
ITL + TU (90 Min.)
- Diversity in road traffic
ITL + TL (90 Min.) + PDT
- Fundamentals of the driving tasks and basic driving tasks
ITL + TL (120 Min.)
- Responsible behaviour in road traffic
ITL + TL (45 Min.) + PDT
- Traffic perception and hazard avoidance**
ITL + TL (90 Min.) + PDT
- Environmentally friendly driving and traffic behavior
ITL + TL (30 Min.)
- Traffic regulations
ITL + TL (45 Min.)
- Behaviour in special traffic situations, in traffic accidents and during traffic controls
ITL + TL (30 Min.)
- Technical Basics
ITL + TL (45 Min.) + PDT
- Handling of the vehicle
PDT

Competence: Class B learner drivers are able to assess traffic situations in terms of dangers and possible behaviour. They act with foresight and defensively in traffic situations in order to avoid dangers as far as possible.



The new driver training – summary

Maintain what is proven - integrate what is innovative

What's new...

- Extended learning time for novice drivers through independent learning activity
- Updated content (e.g. driver assistance systems, automation, traffic perception)
- Extended teaching-learning setting through quality-assured e-learning (“flipped classroom”)
- Closer integration of theory and practice
- Systematic learning assessments throughout the entire training process
- Scientific evaluation of learning and safety effectiveness

... and what will be sustained?

- The function of compulsory driver training in the System of Novice Driver Preparation will be kept (and strengthened).
- Driver training and testing remain organisationally separate and are conceptually more closely linked.
- There will still be degrees of freedom and scope for structuring for the driving instructor.
- The extension of learning time without additional time expenditure for driving instructors enables stable training costs.
- The role of the driving instructor as “education manager” continues to gain in importance.