



National implementation scenario of ICT-DRV quality indicators for: GERMANY

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WP 5 □ del: 13 □ last update: 28/02/2015
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Indicator 1: A supporting and regulating legal and organisational framework

Legal regulations as well as the organisation of work provide the necessary framework for the implementation and, if applicable, recognition of CBT and SBT. This applies especially to the legal framework provided in the context of EC directive 2003/59 and, if necessary, further legal regulations having influence on the implementation of such training alongside regular work as a professional driver. Besides legal aspects also the work organisation provides the learner with the necessary time and framework to participate in CBT/SBT and with the necessary support to transfer newly gained abilities into practical work.

E-learning and simulator training play at this point in time only a very minor role within professional drivers' vocational education and training in Germany. This is also the case for such training methods integration into supporting and regulating legal and organisational frameworks. The German realisation of EC Directive 2003/59 the BKrFQG and BKrFQV (Berufskraftfahrerqualifikationsgesetz and -verordnung) does for instance limit training to training taking place in a class-room which naturally excludes trainings approaches taking place on the distance such as investigated within the scope of ICT-DRV. However, the application of e-learning in a class-room and with a trainer at hand is not restricted. Quality considerations are not available regarding the application of e-learning in the specific context of professional driver qualification. The usage of top-of-the-range simulators is permitted and subject of approval by the respective competent body. A content and technique related specification about the application of simulators is available. (unknown, 2007)

The integration of e-learning into the work reality of professional drivers is a key aspect in the discussion regarding permissibility of this learning/ training approach in the context of the overall discussion on work and rest time and if periodic training is implemented during leisure or work. It is therefore a discussion that clearly goes into legal aspects to be further clarified in case of e-learning becoming generally accepted in the context of the mandatory periodic training in Germany. On the other hand the interviews undertaken within ICT-DRV indicate that also employers are not yet ready to adequately support the application of e-learning among their drivers. Usually e-learning is perceived as a very convenient (because low cost and time saving) approach although not thoroughly trusted because of limited opportunities to control "attendance". But there is only little awareness existing for the need to provide also a supportive work environment to the drivers

E-learning (on the distance) is at this point in time not permitted in Germany in the framework of initial and periodic training for professional drivers.

Training on top-of-the-range simulators is possible in the framework of periodic training for professional drivers. A further specification on technical requirements and contents to be addressed is available.

E-learning faces a number of legal and organisational challenges to be further investigated in Germany in order to make full use of this training approaches' full potential for professional drivers.

in order to actually participate in e-learning offers on the distance and to apply the learning content also practically within work reality.

The legal framework for the application of simulator training is less restrictive and can partially even be considered to support the application of simulators for training because time spend on the simulator is not considered as driving time on the road being an alternative practical training approach. This is partially even used as a marketing instrument in order to argue the benefits of simulator training in comparison to practical training on the road similarly to questions of fuel consumption and availability of trucks during training time. However, also in the context of simulator training the supportive organisational framework to be provided by employers in order to support appropriate realisation of simulator training and to foster the transfer of simulator training outcomes into practical work appears to be an issue not in all cases addressed adequately.

In order to realise this ICT-DRV quality indicator further research but especially discussion among and in between social partners and public authorities are necessary in order to come to sustainable solutions for realizing especially e-learning within the given or even revised legal framework and therefore for paving the way for the application of learning approaches taking place closely to the workplace such as e-learning as investigated in the context of the ICT-DRV project. The current input orientation of the BKrFQG and BKrFQV (based on EC Directive 2003/59) is nevertheless a major obstacle in this regard because it requires the control of time spend in training in order to fulfill the legal requirements. This is very challenging with regard to documentation issues and highly questionable with regard to learning considerations. Opportunities how learning outcomes orientation could facilitate the application of e-learning have been described in the further ICT-DRV project results as well as by Ball (2013). In order to realise such a learning outcomes orientation it is necessary to revise the European Directive as well as the German BKrFQG and BKrFQV in this regard. Recommendations and strategies how this can be done have been described in the ProfDRV national scenario for Germany (Ball, 2012).

Similarly also the further specifications on simulator application within training in the framework of the BKrFQG (unknown, 2007) can be revised based on the learning outcomes approach by specifying the appropriateness of simulator application for the aspired learning outcomes which is in major parts already today the case and provides a comprehensive basis for further considerations incl. the results of the ICT-DRV project.

Simulator training meets a less restrictive and challenging legal framework in Germany. However, also here organisational aspects require further awareness raising in order to make use of the simulators full potential.

The integration of e-learning into professional driver training in Germany requires (1) dialogue among social partners and public authorities and (2) a shift from input to learning outcomes orientation of initial and periodic training for professional drivers.

Requirements on simulator characteristics build a good starting point for the application of the learning outcomes approach and revision under consideration of the ICT-DRV quality standards and project findings.

Indicator 2: **Comprehensive information and counselling**

There are information and counselling measures put in place in order to:

- *inform end-users and decision-makers objectively about CBT and SBT,*
- *enable learners, employers and competent-bodies to decide if a CBT/SBT offer meets their requirements,*
- *enable learners and employers to decide if a the training format CBT/SBT is suitable for an individual learner and/or for a certain learning need,*

- *select and adapt courses to individual training needs of a learner and/or a company and*
- *provide learners and contact persons in their company with the necessary guidance and facilitation before, during and after the course attendance/ implementation.*

Information and counselling structures are so far only rudimentarily provided by vocational education and training providers. Especially with regard to e-learning the strong scepticism against this methodical approach as well as the missing legal basis did so far also not make such structures necessary. The only very limited application of simulators did so far similarly not lead to the development of adequate comprehensive information and counselling structures.

Due to a missing legal basis and relevant volume there are no such structures existing yet in Germany.

The Distance Learning Protection Act in Germany (Fernunterrichtsschutzgesetz) does provide already a set of very basic considerations in this regard and can possibly act as a starting point. It also contains a number of aspects addressed in further elements of those quality indicators and with regard to e-learning. Beyond this Act also a number of quality initiatives regarding continuous training in general and e-learning in particular exist in Germany that can be used as an additional reference in order to realise this quality indicator and based on existing structures.

Possible references for realisation of this indicator exist in a more general context for instance in the "Fernunterrichtsschutzgesetz".

Besides this no structures or systems to build on exist in Germany and need to be developed for instance in a similar way as outlined for simulator application in the context of the BKrFQG (Unknown, 2007).

This kind of requirements could be fixed in a similar way as for simulator application in the context of the BKrFQG.

Indicator 3: Specifically trained trainers and tutors

Trainers/ tutors facilitating technology-based training are – besides regular training for trainers and in professional topics – trained in a number of additional abilities that are based on the characteristics of the technology they are working with in its learning context. This includes among others specialised training:

- *for simulator trainers in the characteristics of learning with the simulator/ simulation, individual and group coaching and debriefing, the design and selection of scenarios and the operation and application of the simulator, its various features and additional tools and*
- *for e-learning tutors in the characteristics of distance learning, e-tutoring, learner motivation and instruction, e-communication and coaching as well as interviewing and feedback techniques.*

At this point in time requirements on as well as competences of trainers for professional drivers in general and specifically in the context of the Driver CPC are very heterogeneous. Driving instructors probably build the biggest group of trainers active in this field¹. It nevertheless needs to be postulated that competences related to the application of learning technology within/for training among those trainers are rather at a low level.

Training for e-tutors and trainers working with learning technology is a rather common and even increasing area of continuous training among trainers. There is of course not yet a need for such training in the context of professional driver qualification but especially with regard to the training of e-tutors but also generally on media competence for trainers existing or currently developed training offers (publicly available or offered by training providers to their trainers in the context of

Existing e-tutor training offers provide a good starting point in order to educate trainers for working within e-learning settings.

¹ There are not figures available on the characteristics of trainers conducting professional driver training.

other fields of training) can provide a very good basis in order to train also trainers for professional drivers with regard to e-tutoring competences. However, it can be expected that some additional competences especially with regard to interview based assessment techniques become relevant in such an application context which is usually not the case within regular e-tutoring training offers. As outlined in the context of the ICT-DRV project training in distance learning settings also requires a very high level of subject related competences, requirements on the trainers subject-related competences as they have been outlined in the ProfDRV scenario (Ball, 2012) should therefore also play a key role for a sound realisation of this quality standard.

Regarding simulator training, training for trainers is usually limited to a technical introduction into the simulator, its set up and use. Further training in terms of learning/ training with the simulator is not provided for simulator trainers. This is, however, also caused by the very limited number of simulators and therefore simulator trainers active in Germany. Simulator trainers usually gain their simulator-specific competence as specified in this quality indicator primarily through learning by doing over time or in rare cases through job-shading experienced simulator trainers. The usual assignment of driving instructors as simulator trainers ensures here of course the availability of basic knowledge, skills and competences necessary in order to train in the context of driving and especially novice drivers. However, it also needs to be considered in this regard that “most experienced drivers only accept instructions from a well-seasoned truck driver. He should be a good truck driver with many miles, many kilometres, many experiences, a good storyteller, and a good instructor, and a good simulator instructor“ (Kappé, 2015, p. 80). Independently from the trainers experience background, simulators might remain a pure simulation of reality without being able to use the simulators full potential as a training tool as investigated within ICT-DRV without additional learning/teaching related training of trainers. Therefore additional training for simulator trainers on specifically this aspect remains a blank spot within trainer qualification. Due to the so far still low number of simulators in training, cooperation already at a developer/constructor level of driving simulators as a kind of extended product-related training offer can therefore be considered as a realistic measure in order to close this gap and ensure a sound competence level of simulator trainers also with regard to training in a learning environment supported by a simulator. This should also be in the interest of simulator developer/constructors because at the end those trainer competences are essential for the success of the simulator as a training tool.

Generally training (as well as basic information) on the practical application of the learning outcomes approach is not yet a matter in Germany. Separate learning offers would need to be created based on the already existing experiences and considerations related to the realisation of learning outcomes based training and teaching in the context of learning outcomes based curricula.

Training for simulator trainers in order to make use of the simulators full potential is not yet available. Simulator constructors/developer might play a key role here in order to overcome this competence gap with regard to teaching/training competences in the context of the simulator.

Information and training related to the practical application of the learning outcomes approach is a general fundamental need of trainers regardless of the application of learning technology within training.

Indicator 4: Application of the learning outcomes approach

The learning outcomes approach with its implications on the quality of training is applied on SBT and CBT. SBT and CBT courses are described in terms of learning outcomes (knowledge, skills and competences) associated with a course, learning environments are adequate to achieve those learning outcomes and, if applicable, assessment takes all kinds of learning outcomes into account and applies appropriate assessment measures.

Furthermore the application of the learning outcomes approach allows the recognition of prior/ non- and informal learning and the recognition of learning outcomes acquired within those CBT/SBT courses in the framework of other (formal) learning outcomes based vocational education and training courses/ certificates.

As outlined earlier just as the European Directive also the German realisation of EC Directive 2003/59 clearly follows a strong input orientation by defining duration of learning and contents to be provided rather than the learning outcomes to be achieved at the end of the learning processes. This applies similarly to other regulated training with relevance for professional drivers such as general license training or ADR training. Although also in Germany the learning outcomes approach has been introduced based on the introduction of the German Qualifications Framework, the approach did (in most cases) not yet reach continuous training offered by primarily private training providers as being the case within professional driver training. It can therefore be postulated that the introduction of the learning outcomes approach with all its consequences (see among others Ball, 2012 and Ball, 2013) for e-learning and simulator training for professional drivers requires a major shift in approaching individual training offers but also training in general.

Learning outcomes orientation is still an unknown concept within professional driver training and requires a complete shift in thinking.

Nevertheless, learning outcomes orientation and their introduction into vocational education and training is currently strongly discussed and explored in the context of formal VET qualifications and the practical application of European tools such as the European Qualifications Framework (the German equivalent being the German National Qualifications Framework, DQR), ECVET or ESCO. It is therefore possible to draw back to a wide set of already existing resources and to the general efforts undertaken in order to apply the learning outcomes approach and the different aspects related to it within formal vocational education and training.

Usage of existing resources on learning outcomes orientation in order to introduce this concept also within training for professional drivers.

A resource that has been specifically developed in order to facilitate the introduction of the learning outcomes approach within transport and logistics is the euVETsupport-initiative (www.euVETsupport.eu). It provides a number of learning offers on this topic that can also easily be adjusted to the concrete case of professional driver training and in order to support VET providers to apply the learning outcomes approach practically.

www.euVETsupport.eu

Indicator 5: Provision of an added value to the learning process

The application of computer- and simulator-based training has a clear added value for the learning process and/or the achievement of the aspired learning outcomes. Technology-based courses are therefore exclusively offered for the achievement of learning outcomes that can clearly benefit from the application of such learning approaches and/or that can be equally be achieved through classical as well as through technology-based training approaches.

Due to the missing legal basis with regard to e-learning such considerations do not

Considerations on the added value of

yet play a role in the specific context of professional driver training. However, there are rich sets of research results available with regard to similar target groups that can be applied also in the context of professional driver training and in order to elaborate on the question how e-learning can generate an added value for learning and the overall learning process. This does equally apply for the application of blended learning approaches. Besides the ICT-DRV results only one reference study exists with regard to effectiveness of e-learning so far (see Peters, 2011). Further attempts to introduce e-learning within professional driver qualification investigated within ICT-DRV lack such considerations on the added value from a learning perspective and rather focus on replacing training in the class-room which can – up to a certain extend and under clear didactical considerations – of course also be an added value for the learning process.

e-learning for professional driver training can draw back to a rich set of existing research results related to other vocational fields.

Also with regard to simulator training research results exist on the way how an added value can be generated for different training settings. However, those research results are limited so far because simulator application is still not a common training methodology in Germany and the focus has in the past clearly been placed on technical improvements rather than on the generation of an added value for the overall learning process. Further research on this topic is therefore necessary in order to realise this quality indicator practically and specifically in the context of professional drivers vocational education and training that goes beyond the usual application context of simulators within driving license training. However, as shown within the ICT-DRV pilot courses also existing research results on the application of learning technology can be successfully applied to simulator training in order to investigate and ensure the added value of the simulator for the learning processes.

Although the added value of simulator training cannot be questioned, further research on the conditions on when and how this added value exists is recommended.

In order to overcome this quality gap existing research results should be further investigated in order to make them usable for practical application in the design of e-learning and simulator training for professional drivers. Their practical considerations, however, requires the overcoming of the existing theory-praxis divide and the resulting hesitancy especially of training praxis to apply such research results in the development and realisation of training. Furthermore blended learning approaches should be far stronger considered within e-learning as well as simulator training in order to find the best possible match between the different methods and in order to realise the aspired added value.

In order to make sure the added value of e-learning and simulator training is adequately taken into consideration and reached research (theory) and praxis need to work closer together in future.

Indicator 6: **Sound and thorough instructional and technological interface design**

The design of CBT and SBT is based on instructional design considerations taking into account the aspired learning outcomes and the needs and characteristics of the learner. This leads to the development of learning environments providing best conditions to stimulate and facilitate learning. Pedagogy drives the choice of instructional technology, not the other way around.

Instructional design considerations are so far only rarely applied within e-learning and simulator training for professional drivers. This circumstance is determined by a number of factors that challenge the application of instructional design

So far instructional design considerations are not sufficiently taken into consideration.

considerations. Those are among others:

- reluctance of praxis to make practical use of research results,
- missing/ low level of educational / instructional design competences among education providers and simulator / e-learning developers in this specific field,
- focus on technical innovations rather than on learning considerations/ innovations and
- perceived complexity of instructional design models (perceived divide between practical training work and research).

However, especially based on the ICT-DRV results as well as on further testing and research results (such as Peters, 2011, Grattenthaler, 2011 and van Emmerik, 2004) the value of applying instructional design considerations on e-learning and simulator training for the learning process is clear. A first step in order to realise this quality indicator should therefore be to raise awareness for the added value of instructional design considerations and their relevance for the learning outcome. This can be achieved through initiatives such as ICT-DRV and *qualifizierungdigital*² and can be further supported through the specific funding of projects applying and further exploring instructional design models for training settings supported by learning technology for professional drivers and in order to support developers and providers to integrate this dimension into the realisation of technology-supported training. The Federal Ministry of Education and Research (BMBF) already offers such funding schemes in the framework of *qualifizierungdigital* (see above).

Funding schemes focussing on realising instructional design improved innovative learning solutions support the development of innovative learning solutions for professional drivers.

While the provision of such quality-facilitating projects is one possible way to improve training quality and foster learning innovation from a public perspective, the realisation of this quality indicator is primarily on the VET providers and e-learning/simulator developers who play a key role here. Finally it is on those key players to integrate instructional design considerations into their research and development work in order to further improve the application of learning technology within professional driver training.

Vocational education and training providers as well as e-learning/ simulator developers play a key role in order to realise this quality indicator.

Indicator 7: Continuous evaluation and further development of CBT/SBT courses

CBT/SBT courses are continuous subject for review, change, improvement and further development in order to adapt to changing needs and requirements and to the state-of-the-art of educational technology. Learning is the leading factor within all evaluation and development efforts.

Evaluation is a regularly applied method in order to improve training courses of any kind all across Germany although implemented very heterogeneously and addressing different parameters. While a majority of courses is primarily evaluated summatively and based on learner satisfaction parameters, also formative evaluation is implemented in order to integrate evaluation already into the development processes and summative evaluation is applied at different stages in order evaluate reaching of aspired learning objectives/outcomes with a concrete

Evaluation is a well accepted concept within vocational education and training.

² <http://www.qualifizierungdigital.de/>

training setting. However, especially summative evaluation assuring the reaching of pre-defined learning objectives/outcomes is not a usual procedure and should be more regularly applied in order to further develop training course designs (with and without the application of e-learning and simulator training) also under consideration of the learning outcomes approach and its requirements on the quality of training environments. Here again VET providers but also e-learning/simulator developers are key players in order to realise this quality indicators within their individual development and training work.

Indicator 8: **Research, sharing and networking on the realisation of SBT and CBT**

The implementation of SBT and CBT requires a continuous dialogue and close cooperation between education providers, developers of CBT and simulators as well as researchers, therefore, continuous sharing, networking and joined research activities are taking place in order to further work on the improvement of SBT and CBT.

Research, sharing and networking among the relevant stakeholders is a key aspect that is strongly supported in Germany through public initiatives such as the already mentioned *qualifizierungdigital* initiative of the BMBF that regularly organises events and sharing opportunities on topics relevant also in the scope of the ICT-DRV project. Due to the fact that professional driver training is strongly related to the policy area road transport/ safety rather than to education, initiatives related to this specific policy area play a more prominent role within professional driver qualification. Such initiatives have also already been implemented through the realisation of the three TTD conferences (Technology-based Training for Drivers) organised by the German Road Safety Council (DVR), the Employer's Liability Insurance Association (BG), the Public Sector Accident Insurance (UK) and the German Insurers Accident Research (UDV) with a focus on the road safety dimension of driver training. Unfortunately this series of conferences has been stopped in 2011. A first attempt to merge both perspectives (vocational education and training and road safety) has been the ICT-DRV conference in Potsdam in February 2015.

Conferences and events focusing on technology-supported training are a rich source for networking, sharing and cooperation.

The topic of especially e-learning but also simulator training also starts to play a role in further discussions among relevant stakeholders especially in the context of the current evaluation and possible revision of EC-Directive 2003/59. The learning perspective does, however, - in the light of administrative and documentation questions - only play a minor role within those discussions that do so far only rarely involve experts representing the education perspective.

Discussions on e-learning and simulator training are pushed through the raise of this topic in the context of Directive 2003/59/EC.

A continuation of networking and cooperation initiatives such as started with TTD and ICT-DRV can be considered as a milestone for the realisation of this quality indicator as long as the education perspective is introduced/kept as an (additional) focal point. But also funding schemes supporting cooperation among the relevant stakeholders in order to develop innovative learning technology solutions - such as the case with the *qualifizierungdigital* initiative - strongly facilitate the necessary dialogue, networking and innovation among key players.

Further conference initiatives integrating the education and the road safety perspective as well as innovation projects involving different kinds of stakeholders will be catalysts for future cooperation, research and networking.

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