ICT-INEX Project

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Guidelines for development of e-learning trainings (including language support for immigrants) and their integration with other applied methods of teaching candidates for professional drivers

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Introduction:

This report contains guidelines for the development of e-learning trainings taking into account availability of the current teaching techniques for the group of candidates for professional drivers. It also sets out the directions of development of teaching methods and takes into consideration development of available technologies which may improve quality of training and the degree of interest of its participant.

We include in the report the growing group of immigrants, indicating necessary directions of enriching training offer for this group.

We also point out limitations resulting from the wording of the applicable law and the need to amend it in view of the growing training market.

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6. Executive Summary

This report analyses presently taken actions in the area of professional driver-targeted e-learning and shows directions which must be followed to use the modern training tools to increase effectiveness and attractiveness of training for drivers and candidates for drivers.

The report also indicates benefits which may be enjoyed by companies providing training to drivers. These are primarily financial benefits acquired due to the implementation of modern visual techniques.

For the purpose of this report, we carried out dedicated surveys. Course participants having their training in Grupa CARGO's training centres were the ones who took part in it. Target groups were selected with regard to their personal profile for the sake of ICT-INEX objectives. Activities covered groups representing various age, with a particular emphasis on a group of persons aged below 30 and above 50. Immigrants were taken into account as well. Since their participation was rather limited, no age division was introduced in this group. Persons who took part in the survey constitute main target groups of the project.

7. Introduction

The report contains the description of activities performed as part of ICT-INEX project which objective is enrichment of a training offer for professional driver courses. It sums up works carried out as part of IO5 of the project. Their final result are guidelines for development of e-learning trainings, also providing language support to immigrants. The guidelines show methods of integration of e-learning trainings into other driver training methods. Such enriched package should constitute an offer tailored to current demand of the training market and at the same time be attractive for training participants.

The report contains an analysis of the course and results of trainings using e-learning as a training method. It indicates possibilities causing an increase of training effectiveness and limitations embedded in the applicable laws concerning trainings for drivers. It specifies legal and organisational recommendations which may increase training quality at the same time reducing its costs.

7.1 ICT-INEX project

The purpose of the project is increasing effectiveness and availability of trainings enabling access to the profession of driver. This is to be achieved through the use of innovative information and communication technologies. The final result is to be a cohesive model of holding trainings for drivers of the transport industry and recommendations for amendments to the national and EU legislation.

7.2 Description of work package

Actions performed for the purposes of the project included recruitment of participants meeting requirements of the project, their participation in individual stages of implementation, a summary and an analysis of obtained data and a description of final conclusions. The present methods of e-learning trainings were analysed in terms of their effectiveness and possibilities of development. An analysis of the results of trainings is aimed at working out a methodology maximising knowledge transfer and simultaneously enhancing effectiveness of individual training stages. The report contains recommendations concerning directions of further actions.

7.3 Structure of the document

The document contains an analysis of current training methods, a description of the activities carried out under the existing project and their effects, suggestions for changes and updates, including ICT, which can be introduced. It defines the role of e-learning trainings in the teaching process and the possibilities of developing these trainings to further improve the effectiveness of this teaching method. It indicates ways of integrating e-learning with traditional teaching methods. . It allows to determine the usefulness of enriching training with new functionalities and to set the direction for the development of the driver teaching industry.

8. Analysis of methods of training candidates for professional drivers through application of traditional methods and with use of e-learning

Traditional training methods applied in training of candidates for professional drivers are concentrated on knowledge transfer by a lecturer to a group of students – course participants. During classes knowledge is transferred verbally, whereas a lecturer may assist himself or herself with multimedia containing static illustrations or instructional videos. An advantage of this method is the application of a direct relationship of master – apprentice type enabling on-going contact and discussion on the subject of classes. It allows to quickly identify problems faced by an apprentice in this relationship and explain on an on-going basis a part of a lecture that is incomprehensive for the apprentice. An unquestionable disadvantage of this training method is the necessity for a trained person to adjust himself or herself to time and place of conducting classes. Due to little flexibility, not everyone may take part in such a training as they are limited by a time-frame of classes and their location. It may even cause resignation from participation in classes when their place is unavailable for an interested person, e.g. for communication reasons.

E-learning method eliminates these barriers. It displays much higher flexibility allowing to hold classes within a time-frame greater than the time of a training. In the consequence, an apprentice may undergo a training at time convenient to him or her, adjusting it to his or her schedule. Unfortunately, a location barrier remains. In this area, national laws on training require undergoing a training in a brick and mortar centre, not allowing to take even a part of classes outside its area. The legislator's assumption is that it maintains the relationship master – apprentice which undoubtedly has a positive influence on training quality. However, it seems that without a significant loss it would be possible to preserve this value allowing to complete a part of the programme outside the area of a centre, and preserve the necessity of direct contact with a trainer – lecturer for a part of classes including a summary of individual subjects.

Other centres also notice advantages of e-learning. At website "www.szkola-jazdy.pl" Dariusz Piorunkiewicz wrote: *Distance teaching, commonly called e-learning, has become a legitimate didactic method. Methods of this type are successfully applied, e.g. by higher education institutions or the flight training industry – a huge part of theoretical trainings is held in this way.*

What is interesting, state organisations also noticed the possibilities offered by e-learning education methods. On top of that, the Polish Agency for Enterprise Development as part of "PAED Academy" co-financed by the European Union offers

a broad range of online trainings addressed to entrepreneurs. Methods of teaching with use of modern computer techniques performed well also in training of professional drivers as part of initial qualification and periodical trainings. Their effectiveness is confirmed by a high success rate in qualifying examinations.

In the context of training candidates for drivers for the last two years, e-learning became an excellent solution for many groups of course participants. They include, among others, persons who due to their professional situation and low flexibility in terms of time may not take part in theoretical classes held in the traditional form, having a driving licence and gaining next qualifications and disabled persons with limited motor function.

Both traditional, and modern teaching methods should be generally available, and a course participant should be able to choose a solution that is optimal for him or her."

Traditional method		E-learning method	
Advantages	Disadvantages	Advantages	Disadvantages
direct contact with a teacher	the need to hold classes in a training centre	the possibility of holding classes outside a training centre	the lack of direct contact with a teacher
	the necessity of adjusting to a timetable of classes	classes may be held at any time	
	the lack of the possibility to update material on an on-going basis	the possibility to update training material practically at any time	
	limited multimedia material resources	broad access to multimedia	
on-going verification of skills of course participants			the periodical possibility of checking knowledge of materials
	adapting a lecture to the average level of a group of	the possibility of customisation of a lecture	

	participants		
	higher cost of remuneration of a lecturer – instructor	lower cost of remuneration of a lecturer – instructor	
	cost of travel to a centre borne by a course participant	reduced cost of travel to a centre by a course participant	
	quality of transfer conditional on the degree of involvement of a lecturer – instructor	uniformity of transfer	
	language barrier	removal of language barrier – material may be presented in a foreign language	

8.1 Recommended qualifications of a lecturer – instructor:

– extensive knowledge on the issues discussed during classes,
– the ability to make students aware of didactic tasks and goals,
– the ability to transfer possessed knowledge, including analysis and synthesis of taught material,
– the ability to point out practical situations in which using gained theoretical knowledge is justified,
– the ability to assess predispositions of training participants in terms of learning discussed subjects,
– the ability to use tools utilised for training,
– proficiency in foreign languages used in e-learning,
– the ability to assess the degree of learning material by training participants.

In traditional training, the method of conducting the training and its final result are conditioned, among others, by the qualifications of the lecturer. It depends primarily on a lecturer, what amount of information will be taught and what scope of information will be learned by students. The qualities listed above directly affect the final outcome. Psychophysical qualities, degree of fatigue, pedagogic experience – all this directly affects the final outcome. The e-learning method eliminates negative features of direct work with a student, introducing a method allowing for,

regardless of a place of a training, the transfer knowledge in the same normalised way evading imperfections being a human quality.

An important social mission of a lecturer – instructor is preparation of a future driver to participation in road traffic. The former's task is to equip a driver with proper knowledge and skills necessary for driving a vehicle in road traffic and shaping personality traits that are necessary for being a good and responsible professional driver. Therefore, a lecturer – instructor has to have relevant qualifications and character traits thanks to which learning process will proceed correctly and effectively. Furthermore, an important skill in the teaching process is assertiveness. Assertiveness may be understood as behaviour, self-confidence and high self-esteem, communication, self-fulfilment skills. An instructor or a lecturer making an impression of a person who feels comfortable in his or her role and is well-organised has the highest chances for gaining trust of course participants. During a training the role of an instructor is also showing a student his or her strong and weak points which will help the latter in assessment of his or her predispositions to being a professional driver. Actions taken by a student in a road traffic depend on the way in which a student perceives his or her knowledge, skills and mental fitness. An instructor should be able to assess the condition and rate of learning new contents by a student and student's psychomotor fitness, and practise things presenting greatest difficulties.

9. Analysis of actions in professional driver training with use of e-learning

The e-learning method is applied on a daily basis in the training centre of Grupa Cargo. The centre uses it as part of training, among others, of candidates for professional drivers as part of the so-called initial qualification and in professional driver training in periodical training aimed at refreshing learned information and familiarising this group with novelties in laws which occurred from the moment of a previous training. Classes are held under supervision of an instructor, that is the traditional method requiring an active participation of an instructor is combined with the e-learning method showing material with use of audio-visual techniques. This method of implementation results from Polish regulations. This is mentioned in § 12 point 1 of the Regulation of the Minister of Infrastructure on the training of drivers performing road transport.

A training in the Russian language is also launched, and it is directed to a group of immigrants mainly from the area of Ukraine and Belarus. In these countries transport companies are currently recruiting drivers who fill in staff shortages in this occupational group in Poland. Grupa CARGO's training centre is planning to introduce a training in the English language, as a growing group of persons using this language, as their second language (besides their native language), starts to appear in Polish professional driver market. The plans correspond with the expectations of training centres that we cooperate with. It is easier to carry out training process with respect to a group of foreigners not proficient in the Polish language when training materials in a foreign language may be used. We can clearly see here a significant advantage of the e-learning method. It could be even said that it is friendly for training participants and personnel working with them.

At this time, the Polish market offers through websites several versions of online qualification trainings. They differ in graphics, while the content is very similar as it was precisely specified in the "Regulation on training of drivers…" Each training contains obligatory material divided into strictly defined chapters. Companies also offer a selection of test questions aimed at preparation to a final examination. Individual websites differ in the possibility of purchasing a traditional textbook offered by some training centres, graphic content and up-to-date nature of knowledge base. It can be concluded that the market has a relatively high potential for development. However, exploiting the potential requires elimination of limitations concerning location of training in centres. This would allow to fully realise the potential offered by the e-learning method. Mobile applications which, as the name suggests, enable familiarising with contents practically at every place

could be then used for teaching training contents. Presently, they may be only used for a kind of a practice before an examination through online tests.

10. How was the e-learning platform implemented for the purposes of the project?

Every day, CARGO, which trains drivers and candidates for drivers, uses the E-CARGO e-learning platform to implement the trainings. It has a number of electronic driver training courses used to familiarize trainees with the knowledge they need to become acquainted with in order to pass the exam permitting the driver's profession and then to properly and safely practice their profession.

The platform owned by CARGO supported the training of people whose assessment and obtained results were then analyzed. For the purposes of the project, trainings implemented during the project were used. These were trainings on professional qualifications for drivers, which were compulsory trainings. As a standard, they take place in two parts: theoretical and practical. The theoretical part was implemented in two ways:

• Through classes in the traditional way with the lecturer conducting the classes
• Through the use of an e-learning system supporting the teaching process by the lecturer.

The differences in methods are presented in the table below:

	traditional method	e-learning method
duration of classes	according to the schedule anticipating meetings for the whole group at the same time	according to the schedule determining the time frame for group members giving flexibility in choosing the time of classes
place of conducting classes	resort area	training centre
way of conducting classes	lecture, presentation, instructional video, discussion moderated by the lecturer	multimedia materials presented through the content of e-learning training, including: training text, static illustrations, animations, films; materials presented by the lecturer that are not e-learning content,

		lecture, discussion
training results	average exam grade for people trained with the traditional method: 56%	average exam grade for people trained with e-learning method: 78%

It should be noted that participation in classes using the e-learning platform was used to enrich classes in relation to the traditional method. It also aimed to stimulate people participating in the training, initiate discussions about the content of the platform and the possibilities of enriching it. Suggestions received during classes indicate that it is no longer enough to present training elements in the form of text and even multimedia illustrations. The expectations of the participants are cooperation from the lecturers, answering problem questions, stimulating discussions. It should also be noted that the interactivity of the platform, its "friendliness" is of great importance. The graphic layout must be easy to understand and facilitate navigation.

For the needs of the project, groups and people trained by the center at that time were analyzed. The attendance of trainees in classes, their involvement as well as the assessment of training methods were assessed. As you can see in the table above, the results obtained at the end of the training were analyzed. Both the assessment of trainees and the exam results obtained by them indicate the advantage of the e-learning method over the traditional one. Examination reports were used to calculate the final results presented. Unfortunately, due to personal data protection, source materials cannot be presented here.

11. Analysis of the currently implemented methodologies concerning various driving techniques used for training of professional drivers and candidates for drivers

At the same time, the centre holds classes with use of exclusively the traditional technique based on teaching of an instructor – lecturer. Thus, it is possible to compare training outcomes with use of both techniques.

These methods display the following differences:

- ➢ with respect to the traditional method:
  - – the method imposes time limitations of a provided training,
  - – the centre is forced to gather a certain minimal group of people for the training to be profitable,
  - – a person giving the training must have training material,
  - – the training centre does not have to have computers in the number appropriate for service of course participants,
- ➢ with respect to the e-learning method:
  - – the lack of time limitations regarding opening hours of the training centre,
  - – classes may be held even for one person,
  - – it is possible to quickly update material,
  - – a person giving the training is basing on material used by a trainee,
  - – the training centre must have computer hardware enabling access to training material.

To sum up: the e-learning method is more friendly to both parties of a training. It allows to save time and costs by the training centre (no expenditures on lecturer's remuneration) and a course participant (reduction of travel costs). It causes standardisation of teaching information – uniform content for may persons trained in different locations and time. It individualises time in which the training process is carried out. It is always profitable irrespective of time and the number of trained persons. It allows to introduce updates at any time in the simplest possible way.

12. Functionalities of e-learning expected by users

Newly introduced techniques create the user needs which they were not previously aware of, and the needs which occurred upon contact with a new technology. In trainings held at Grupa CARGO these expectations are expressed by cooperating centres and end-users being drivers and candidates for professional drivers.

Training participants expect:

- regular broadening of the offer in terms of subject-matter,
- increasing the number of illustrations of material, including video materials,
- development of the system in terms of new language versions,
- facilitations concerning operation, e.g. supporting automation in certain actions,
- increasing the number of available documents generated by a training programme,
- constant phone support.

It needs to be added that the possibility of a relatively broad law interpretation by authorities supervising training centres results in a relatively large diversity of expectations depending on a location. Its consequence is a highly extended and complex system which has to combine often contradictory suggestions of centres.

In Poland, centers conducting a training process that encounter inconsistent interpretation of regulations in the control process are forced to store documentation in a form depending on the location of the center. CARGO as a centre making available a training programme containing also training documentation in the form of class registers, registration forms, etc. is often forced to customise documents for a specific training centre. We recommend that the form of entire documentation for initial qualification trainings was standardised with, e.g. a regulation of the Minister which will simplify the form and increase transparency for inspection bodies. Such a solution has no disadvantages. It works well on a day-to-day basis in training concerning obtaining a driving licence where forms of documentation are uniform in the scale of the entire country.

In the period from September 2018 to February 2019, several dozen interviews were conducted to identify the most important problems encountered in everyday training by both the trainers and training participants. About 20 interviews were held with the owners or trainers, and about 40 with people participating in the trainings. Based on them, the following expectations were determined:

- Contacts with persons running training centers as well as persons participating in training, whose contacts in 2018 and 2019 were several dozen indicate the need for the following changes in the Polish training organization system: simplification of access to training material, not imposing a territorial limitation, which unfortunately may not be implemented as of this day because it is restricted by laws laying down the obligation of holding a training in the area of a training centre,
- development of next language versions,
- high flexibility in access as regards time-frame.

13. Consequences of introducing language support

The already introduced and used language versions and language versions on the stage of design are aimed at reaching a new group of users being immigrants. These persons, finding themselves in new surroundings, face various kinds of barriers starting from interpersonal contacts, problems in contacting the authorities requiring various types of documents to difficulties in finding an employer. On the top of that, they encounter a language barrier during an obligatory training required without which they may not be professionally active.

The offer containing material in a language known to them arouses interest in this form of training facilitating and sometimes even enabling finishing the required training. Furthermore, it builds an image of a country interested in their stay and work, not to mention making an impression of a country friendly to immigrants.

Use of a training offer focused on immigrants in the field of language facilitates assimilation of these persons, makes it easier to find a job, simplifies learning of training material.

In recent years, Polish transport companies cooperating with CARGO and other carriers face the shortage of qualified drivers. They try to fill in the shortage by looking for personnel in neighbouring countries, e.g. in Ukraine. There is high demand for qualified drivers of vehicles with permissible maximum laden mass over 3.5 t. According to the estimates of the International Road Carrier Association (ZMPD) in Poland, every year about 30,000 drivers are needed. The situation behind our western border is similar. There, Polish drivers are employed, although there is a shortage of them in our country. Therefore, Polish entrepreneurs more and more frequently utilise reinforcements from behind the eastern border. Such a person has to undergo medical examinations and psychological tests, and of course has to have a driving licence in a relevant category. The person also has to complete a driver qualification training and obtain driver attestation in the General Inspectorate of Road Transport. A sign of the degree of complexity of laws is the scope of documents which has to be filed to obtain the aforementioned attestation (*source – website of the GIRT*):

1. a copy of a Community licence,

2. a certificate of employment of a driver and meeting requirements by a driver laid down in Art. 39a of the Road Transport Act of 06 September 2001 (ZZ), together with documents:
   a. a photocopy of a document confirming completion by a driver of a required initial qualification training/periodical training,
   b. a photocopy of a medical certificate of the lack of health contraindications for working on the position of driver,
   c. a photocopy of a psychological certificate of the lack of health contraindications for working on the position of driver,
3. a photocopy of a document confirming the fact of legal employment of a foreigner in the territory of the Republic of Poland, e.g.:
   a. a declaration of the intention to employ,
   b. a temporary residence card for the territory of the Republic of Poland together with a decision issued by Governor of Voivodeship permitting to work for an applying company,
   c. permanent residence card,
   d. a Pole's card,
   e. a permission to working in the territory of the Republic of Poland,
4. a photocopy of a document confirming driver's ZUS ZUA social insurance with information on sending and confirmation or a ZUS RCA/RSA document from the last month (in case the date of registration for the obligatory social insurance (ZUS ZUA) is older than 3 months),
5. a photocopy of a passport (pages with driver's details),
6. a proof of payment of a fee for issuing driver attestation.

The report of PWC "The labour market of drivers in Poland" presents the matter as follows: *"One of the problems both for entrepreneurs, and foreigners interested in work in Poland is complexity and lengthiness of administrative procedures necessary for legalisation of stay and work of a driver in the territory of Poland and the necessity of passing qualification tests in the Polish language."*

The latter barrier has been eliminated for people speaking the Russian language. Currently, it is possible to take tests in this language which resulted in achieving results comparable to people speaking the Polish language.

Polish transport companies train and employ foreigners. The report of PWC "The labour market of drivers in Poland" outlines the scale of the shortage of drivers in the following way: *"In Poland no data is available which would allow to precisely determine the number of professionally active drivers of trucks and passenger vehicles. On the basis of information on the number of persons undergoing periodical trainings every year and acquiring initial qualifications we estimate that this number presently amounts to 600-650 thousands. Accordingly, about 20 per*

cent scale of the shortage means that at this time in the market there should be over 100 thousand active professional drivers more. Additionally, gathered data indicates that every year around 25 thousand people leave the profession, while the number of people obtaining initial qualification in the same period is around 35 thousands. This difference does not allow to make up for the existing shortages, even if we assume a decrease in the rate of growth of industries in 2016-2025 to about 2.5-3% a year. At the present number of people leaving the profession, the number of people gaining initial qualification every year should amount to about 60 thousands. Due to the economic significance of transport, halting growth of this industry by the shortage of drivers will also negatively affect the balance of payments of Poland, directly contributing to the deterioration of the balance of services and limiting the possibilities of export of goods by domestic companies. The further existence or growth of the scale of the shortage of drivers may also cause considerable disturbances in logistics, trade, construction industry and in the chosen industrial sectors which particularly depend on effective functioning of road transport. The road freight transport industry is also of high importance for the situation of Polish lease entrepreneurs constituting a significant element of the financial sector."

To facilitate assimilation of drivers from neighbouring countries, CARGO introduced courses in the Russian language enjoying great popularity among training companies and drivers. Another step is the introduction to English language courses as a certain interest of transport companies in other directions of immigration may be observed.

The training industry sees the necessity to eliminate language barriers where possible. E.g. the website devoted to driver trainings http://www.uprzewoznikow.pl/ already has its Russian-language version.

14. Analysis of the course and results of trainings, methodology of holding e-learning trainings in the context of maximisation of knowledge transfer

On the basis of own experiences in holding initial qualification trainings with use of e-learning as the method of holding theoretical classes, CARGO declares that it is justified to develop this training method in combination with other methods, such as VR, supporting practical classes.

Surveys covered groups of persons participating in driver qualification trainings. Several-person groups including persons of various age were available. A group of immigrants was available as well.

Trainings were provided with the e-learning method with respect to the theoretical part. The practical part was completed with a driving simulator, and was partially preceded by a training with use of VR. Initial qualification trainings are held in line with the requirements of the "Road Transport Act" of 2001 and the "Regulation of the Minister of Infrastructure on training of drivers engaged in carriage by road" of 2010.

The above documents specify the required number of hours and permitted training methods. In Poland the number of theoretical classes is conditional on the age of a driver taking part in the training. As an example, for C category allowing to practise the profession of truck driver in the age of 18 it is necessary to undergo 280-hour qualification, while after reaching the age of 21 the number of hours of qualification falls to 140.

Groups assessed for the purposes of this report were composed of persons over the age of 21, hence, qualification involved 140 hours. When analysing the course of the training in the theoretical part held with the e-learning method, it is necessary to point out an unquestionable advantage enabling a flexible choice of hours in which training is held. Opening hours of the training centre are a kind of a limitation, nevertheless, it is usually a larger scope than the maximum number of hours which may be completed by a course participant during one day. Here, the Polish legislation limits the number of theoretical classes to seven which allows course participants, in case of CARGO, to choose both morning and afternoon hours. We do not argue with the number of hours. The number set out by the laws is consistent with our observations showing that the rate of learning knowledge considerably decreases at the end of classes. Consequently, the number should not be increased. In turn, we suggest to free the place of a part of theoretical classes from location of a centre. It would offer the possibility of reducing trainees' costs of travel to the centre, higher flexibility of gaining knowledge, hence, improvement of effectiveness. I would like to refer here to the publication of Bogusław Madej,

Jarosław Kobryń and Marek Ziemian entitled*: "E-learning – new possibilities of improvement of qualifications in transport".* It details advantages of this method, pointing out, among others, time and money-saving by course participants in the consequence, among others, of the possibility of delocalisation of the place of training. The laws currently force to hold trainings in the area of a training centre ("Regulation of the Minister of Infrastructure on training of drivers engaged in carriage by road", Section 12), we point out the need of amending the laws to allow completing a part of the training in course participant's place of residence. Then, classes held in a training centre would have the form of consultations with a trainer – lecturer and would allow to periodically verify learned knowledge. According to our observations, higher flexibility of hours, which allows to transfer classes outside a training centre, ensures higher effectiveness of gaining knowledge by a course participant. These hours are more effective. As part of classes held in a CARGO centre we carried out short tests illustrating the degree of learning material. The laws on training, and specifically Clause 12 mentioned above, require carrying out a test verifying knowledge after every periodical training module. Such tests were carried out during classes on the e-learning platform. The group covered by the test numbered about 30 people of different ages from 23 to 55 years old. The tests used as standard in the e-learning platform were used. They were carried out after about 2 hours from the start of classes. Test sessions were also done at the end of 7 hours of classes. The time taken to complete the test depended on the current stage of training. For the purposes of assessment, only the results achieved in the first and last two hours of training were taken into account. These tests conducted as part of CARGO classes showed better results in the early hours of classes than when the tests were carried out at the end of training classes. The said work "*E-learning – new possibilities of improvement of qualifications in transport*" straight out argues that monitoring of teaching results, in the present state of IT technology, may be carried out remotely. To our mind, maintaining a certain contact with a trainer – lecturer is necessary for preserving the relationship "master – apprentice". It allows to directly discuss subjects difficult for a student. However, it does not require trainer's constant presence.

The practical classes were held in a CARGO centre in two ways. A part of participants took part in them, simultaneously completing an initial stage with use of VR, whereas the second group completed classes on a simulator without an initial part with use of VR. The results were presented at a conference in December in the registered office of CARGO, here they were included in chapter 8. They indicate that introduction of VR to a training is advantageous for a course participant, we recommend this method as recommended for implementation in initial qualification trainings.

14.1   Training methodology

In consideration of the necessity of holding an e-learning training in the area of a training centre, we are actually dealing with the application of b-learning, i.e. a method called blended – learning. This method combines traditional methods and elements of e-learning.

As Maryam Tayebinik and Marlia Puteh from the Faculty of Education, Universiti Teknologi Malaysia wrote in the article "Blended Learning or E-learning?" *"The emergence of the Internet increased the demand for distance education and the concepts such as online learning or e-learning. Online education system was to a large extent used in higher education which led to conducting studies to discover its strong and weak points. E-learning environments have certain disadvantages, such as halting the socialisation process of individuals resulting in the lack of direct communication, thus, a new environment appeared. This new environment combines e-learning and classic learning environments. It was called hybrid or mixed learning. It is believed that diverse methods of delivering content may raise the number of students, satisfaction from educational experience, and effects of learning. Blended learning combines active learning environment with flexibility in use of resources. Furthermore, distance teaching increases students' commitment, ensures interactive environment of communication between teachers and students as well as may facilitate joint actions in various forms of contact – both remote and direct".*

Blended learning may be carried out through:

- mini lecture,
- multimedia presentations,
- a discussion in which a trainer is a moderator,
- a training game oriented on achieving specific goals:
  o solving a specific task,
  o obtaining points indicating the level of knowledge and skills of a course participant compared to other participants; however, it does not concern only participants taking part in a training in the same time, but also persons who completed the training in the future,
- individual work on the basis of an e-learning programme – familiarising with training material,
- work with e-learning – solving control tests,
- existential exercises,
- summing up obtained knowledge.

In chapter 11 we presented proposals of modifications of a training programme taking into account the blended learning method.

15. Analysis of possibility of introduction of gamification mechanisms and advanced 3D visualisation technologies

When talking with persons who have not previously encountered the term of gamification one can hear an opinion that the introduction of this element to the teaching system means trivialisation of teaching and the implementation of elements of play to this process. However, gamification is not a game, although it is commonly perceived as such. It is a tool enabling application of mechanisms regulating games to the teaching process.

In Poland, the CARGO Group introduces gamification at the evaluation stage. A score is added to position the trainee in the results ranking. In this way additional motivation to learning is generated. No absenteeism, getting a positive test result on the first try means more points, better place in the ranking, greater satisfaction with the result and rewards. Points may be currently acquired for results in gaining knowledge. The introduction of points for regularity of participation in classes could be another stage of gamification. It will be possible to gain points also for elective participation in tasks based on scenarios using typical situations of driving a vehicle, containing problematic events which a course participant would have to correctly solve. Time and quality of solving a problem will translate into the number of acquired points. In turn, points should allow to obtain prizes and bonuses. The possibility of creation of own avatar may be a form of a prize. It creates a stimulus encouraging to learning, and does not affect the cost of training a relevant person.

The introduction of the above elements to a training programme urges to simultaneously introduce visualisation based on 3D technology.

The currently available platforms in which we may utilise the idea of gamification are among others. Euro Truck Simulator. During the game a player tests his or her ability to drive vehicles of this type by taking part in one of many available game modes.

Figure 1 ETS station

The game offers a high number of game modes allowing to test our ability to control a multi-wheel truck. For the purposes of the system, to accustom a trainee with 3D visualisation, free driving mode is used in which a driver may travel through extensive areas and transport various goods from point A to point B located many kilometres away. A driver has large space at his or her disposal through which he or she may freely move and test a chosen truck model in various conditions. Additional features of ETS are, among others, graphic effects simulating driving in various climatic conditions and the possibility of grading difficulty level. This stage of a training may be treated as an introduction accustoming a person to work in 3D conditions and as an entertainment stage making the training more attractive. It also allows placing a trainee in a ranking, giving points to the trainee for completing a driving stage in accordance with assumptions and reducing the number of points in case errors are committed. Irrespective of the above, this stage is an introduction to work on a professional simulator in which training is provided that is consistent with official requirements also with the application of 3D visualisation technology.

Figure 2 Station of driver training simulator

In the consequence of conducted tests a positive impact of the introduction of 3D visualisation on the early and advanced stage of a training was noticed. It enhances attractiveness of a training which may contribute to the growth of popularity of trainings among interested persons. It also improves quality of teaching material – a trainee displays higher interest in taught information which improves the final result of a training.

Example scores achieved by course participants during a training with use of Euro Truck Simulator are presented below:

Responsible partner: ITS / CARGO **ETS** Date: 07/02/2019 Target group: <u>1</u> 2 3 (mark appropriate) Type of simulator (high-end / low-end) <u>ETS</u> Gearbox: automatic/manual				
1. Driving in the lowest and highest power ranges, with tracing fuel consumption	RESULT	% DEVIATION FROM NORM	NORM	NUMBER OF POINTS
Motorway				
average fuel consumption (l/100km)	24	100%	24	1
travel time	14,8	99%	15	1
number of errors	1,2	120%	1 -	1
number of times brake pedal was pressed	5,2	104%	5 -	1
Mountainous area				
average fuel consumption (l/100km)	30,4	101%	30 -	1
travel time	17	113%	15 -	1
number of errors	1,6	160%	1 -	1
number of times brake pedal was pressed	5,4	108%	5 -	1
Undeveloped area				
average fuel consumption (l/100km)	25,4	98%	26	1
travel time	14,8	99%	15	1
number of errors	1,2	120%	1 -	1
number of times brake pedal was pressed	4	80%	5	2
Developed area				
average fuel consumption (l/100km)	28,8	103%	28 -	1
travel time	16,2	108%	15 -	1
number of errors	1,2	120%	1 -	1
number of times brake pedal was pressed	4,6	92%	5	1
2. Tests of braking in a special area, drawing attention to various effects depending on braking technique: reaction time from noticing an obstacle to the beginning of braking (emergency braking)	RESULT (reaction time)	% DEVIATION FROM NORM	NORM	NUMBER OF POINTS
Undeveloped area – sunny weather	0,6	86%	0,7	2
Undeveloped area – rainy weather	0,8	100%	0,8	1
Developed area – sunny weather	0,74	106%	0,7 -	1
Developed area – rainy weather	0,9	113%	0,8 -	1
			TOTAL POINTS -	2
Groups: 1. Unemployed young people (- <29 years) 2. Persons long-term unemployed (+50 years) 3. Immigrants (including refugees)				
** It is preferred to: minimise fuel consumption shorten travel time no errors minimisation of use of brake reaction time as short as possible				

Table 1 ETS scores

 A score achieved at the final stage of a training carried out on a 6-level vehicle simulator used for professional qualification trainings also improved.

Scores below:

Responsible partner: ITS / CARGO Date: 07/02/2019 Target group: 1 2 3 (mark appropriate) Type of simulator (high-end / <u>low-end</u>) Gearbox: automatic/manual	**SIMULATOR after ETS**		
1. Driving in the lowest and highest power ranges, with tracing fuel consumption	RESULT	% DEVIATION FROM NORM	NORM	NUMBER OF POINTS
Motorway				
average fuel consumption (l/100km)	21,8	91%	24	1
travel time	13	87%	15	2
number of errors	0,4	40%	1	5
number of times brake pedal was pressed	4,2	84%	5	1
Mountainous area				
average fuel consumption (l/100km)	28,6	95%	30	1
travel time	14,6	97%	15	1
number of errors	0,8	80%	1	5
number of times brake pedal was pressed	4	80%	5	2
Undeveloped area				
average fuel consumption (l/100km)	23,8	92%	26	1
travel time	14	93%	15	1
number of errors	0,6	60%	1	5
number of times brake pedal was pressed	4,2	84%	5	1
Developed area				
average fuel consumption (l/100km)	26,2	94%	28	1
travel time	14,4	96%	15	1
number of errors	0,4	40%	1	5
number of times brake pedal was pressed	4,6	92%	5	1
2. Tests of braking in a special area, drawing attention to various effects depending on braking technique: reaction time from noticing an obstacle to the beginning of braking (emergency braking)	RESULT (reaction time)	% DEVIATION FROM NORM	NORM	NUMBER OF POINTS
Undeveloped area – sunny weather	0,6	86%	0,7	2
Undeveloped area – rainy weather	0,68	85%	0,8	2
Developed area – sunny weather	0,6	86%	0,7	2
Developed area – rainy weather	0,72	90%	0,8	1
			TOTAL POINTS	**41**
*Groups: *1. Unemployed young people (- <29 years)* *2. Persons long-term unemployed (+50 years)* *3. Immigrants (including refugees)* *** It is preferred to:* *minimise fuel consumption* *shorten travel time* *no errors* *minimisation of use of brake* *reaction time as short as possible*				

Table 2 Scores 6-level simulator after ETS

Scores obtained on a six-level simulator without initial classes on ETS in table below:

Responsible partner: ITS / CARGO
Date: 07/02/2019
Target group: 1 2 3 (mark appropriate)
Type of simulator (high-end / low-end)
Gearbox: automatic/manual

1. Driving in the lowest and highest power ranges, with tracing fuel consumption	RESULT	% DEVIATION FROM NORM	NORM		NUMBER OF POINTS
Motorway					
average fuel consumption (l/100km)	22,8	95%	24		1
travel time	14,4	96%	15		1
number of errors	0,4	40%	1		5
number of times brake pedal was pressed	4,6	92%	5		1
Mountainous area					
average fuel consumption (l/100km)	31,2	104%	30	-	1
travel time	15,2	101%	15	-	1
number of errors	2	200%	1	-	1
number of times brake pedal was pressed	4,8	96%	5		1
Undeveloped area					
average fuel consumption (l/100km)	26	100%	26		1
travel time	15	100%	15		1
number of errors	1,2	120%	1	-	1
number of times brake pedal was pressed	5,4	108%	5	-	1
Developed area					
average fuel consumption (l/100km)	28,4	101%	28	-	1
travel time	14,4	96%	15		1
number of errors	0,8	80%	1		5
number of times brake pedal was pressed	5	100%	5		1
2. Tests of braking in a special area, drawing attention to various effects depending on braking technique: reaction time from noticing an obstacle to the beginning of braking (emergency braking)	RESULT (reaction time)	% DEVIATION FROM NORM	NORM		NUMBER OF POINTS
Undeveloped area – sunny weather	0,66	94%	0,7		1
Undeveloped area – rainy weather	0,82	103%	0,8	-	1
Developed area – sunny weather	0,66	94%	0,7		1
Developed area – rainy weather	0,9	113%	0,8	-	1
			TOTAL POINTS		12

*Groups:
1. Unemployed young people (- <29 years)
2. Persons long-term unemployed (+50 years)
3. Immigrants (including refugees)

** It is preferred to:
minimise fuel consumption
shorten travel time
no errors
minimisation of use of brake
reaction time as short as possible

Table 3 Scores 6-level simulator without ETS

Becoming familiar beforehand with 3D reality eliminates the stage of accustoming to this visualisation system during a qualification training.

Use of virtual reality may also have a noticeable impact on the cost of trainings held by training centres. It may reduce the cost of trainings held on vehicles in the conditions of real driving. A person undergoing a training in 3D conditions is a person who may then learn a part of skills, whereby the number of hours completed in real conditions may be limited to minimum.

Virtual reality enables training in conditions unattainable in reality, e.g. simulation of driving in areas which are not situated near a centre or in climatic conditions unavailable for the location of a centre.

16.   Qualifications of an instructor managing a training utilising modern visualisation techniques

An instructor managing a training should have:

- knowledge of the content of a training programme enabling holding a conversation to understand to a course participant problems which are incomprehensible for the latter,
- quick learning skills necessary to update training material on an on-going basis due to frequently occurring amendments to laws,
- openness to amendments to the laws concerning a training programme,
- communication skills necessary for contact with course participants,
- ability to solve conflicts,
- clarity of expression,
- empathy,
- ease of use of multimedia,
- openness to new technologies changing a training method,
- ability to operate gamification platforms utilising 3D technology,
- ability to teach the principles of use of 3D platforms to course participants.

17. Recommendations allowing to hold effective e-learning trainings with use of the remaining teaching techniques

1. For the theoretical part:
    – at the end of the theoretical part we recommend to administer an internal examination, similarly to trainings for driving licence
2. for the practical part:
    – introduction to division of trainings into stages – the necessity of holding parts of a training in the conditions of virtual reality preceding a training on a simulator
    – a training on a simulator should precede a training in the road conditions
    – a training in the road conditions should have a recommendation of registration for the purposes of reconstruction of its course in the conditions of simulation
    – another stage after the road conditions should be the return to training on a simulator where student's work in the real conditions should be assessed

18. Proposals of modifications of a training programme taking into account to date experiences with a suggestion of legal amendments.

Taking into account own experiences of Cargo and signals from cooperating centres, we recommend the introduction of amendments to the applicable legislation aimed at improvement of quality and effectiveness of trainings.

As of this day, the state in Poland is several Acts and regulations governing the driver training process.

The fundamental Act is "Act on Drivers" which last consolidated text was announced on 21 February 2019. It regulates the required age of individual driving licence categories, it also sets the scope of qualifications of individual categories. In chapter 4 it specifies in detail the training process to obtain driving licence, indicating persons meeting requirements to conduct trainings, the document flow process. Chapter 5 lays down requirements for a training centre. Another document: "Regulation of the Minister of Infrastructure on training of drivers engaged in carriage by road" of 2010, as amended. In chapter 3 it sets out the conditions of holding a training referring to appendix no. 1 specifying in detail in table no. 2 and 3 specialist subjects related to C and D category of driving licence. We listed recommendations below which must be implemented to improve quality, attractiveness and effectiveness of training and at the same time to reduce its costs in a feasible way.

E.g. point 1.3 in table 2 includes the subject of loading a vehicle in line with the OHS requirements and the principles of operation of a vehicle. As part of exercises, a course participant should learn correct load distribution, techniques of securing load, selecting the most optimal means. We recommend to admit the possibility of carrying out a part of these exercises with use of a virtual reality simulator. It may result in enriching an offer of centres being at disposal of course participants with their more interesting configuration and creation of situations unavailable at a given time in the area of a training centre. Simultaneously, it will reduce financial expenditures borne by training centres in the consequence of the need to purchase real means of training.

In turn, point 1.4 as part of which a training simulating mechanical and electrical failures of a vehicle is to be held is perfectly suitable for transferring into the environment of virtual reality with use of a simulator. This environment gives

unlimited possibilities of creation of various simulated failures, where the only limitation is imagination of its designer.

For table no. 3 specifying the subject of specialist trainings for D category point 1.5 contains the subject related to simulation of failures, and point 1.7 calculations of vehicle payload and passenger distribution. As we can see, these subjects are perfect for training in the conditions of a simulator. We recommend that in the future our legislation gives legal possibilities of use of a training method of this type.

We also recommend to introduce elements of gamification into the e-learning teaching process. Gamification considerably improves effectiveness of attaining a goal, on one hand it emphasises self-reliance, on the other sharing knowledge, and confrontations of other points of view. It also hones interpersonal skills, in particular with respect to communication between its participants. Work autonomy and the social aspect of gamification enhances the sense of individual and group responsibility of a participant. Qualifications which should be highlighted among participants should include most of all:
 – readiness to cooperation
 – readiness to face ambitious challenges
 – ease of adaptation to changing conditions of the surroundings
 – perseverance in pursuing set goals
 – independence in action
 – openness to new ideas
 – acceptance of obtained scores

Gamification brings specific benefits. Scores obtained during it motivate to further improvement. The formula of classes may violate user's comfort zone, but due to acquired interpersonal skills users assume the attitude of tolerance and acceptance. It also induces to face new, unknown reality.

A properly constructed gamification structure requires creative thinking, and contributed effort may be a source of satisfaction, especially when it entails acceptance of obtained scores.

19. Laws regulating training of drivers in Austria

In Austria, the following legal acts regulate the training of professional drivers:

- "Regulation on initial and periodic training for professional drivers" (BGl. II Nr. 139/2008)
- "Regulation for Professional Driver Apprenticeship" (Berufskraftfahrer / Berufskraftfahrerin – Ausbildungsordnung)
- „Act on motor transport" (Bundesgesetz über das Kraftfahrwesen). BGBl. Nr. 267/1967
- Decree of the Federal Ministry of Traffic, Innovation and Technology (BMVIT-167.533/0025-II/ST5/2010)
- Act on commercial freight transport (Güterbeförderungsgesetz, BGl. Nr. 593/1995)
- Act on Occasional Traffic (Gelegenheitsverkehrs-Gesetz, BGBl. Nr. 112/1996)
- Act on driving lines (Kraftfahrliniengesetz, BGBl. I Nr. 203/1999)

In 2008, the "Bundesgesetzblatt BGBl. II Nr. 139/2008[1]" (Federal Law Gazette) legally anchored the Directive 2003/59/EC for the "Certificate of Professional Competence" (CPC) training of truck and bus drivers into Austrian Law. The BGBl. II Nr. 139/2008 regulates the CPC qualification (initial and periodic training) and since that time, professional drivers have to hold a CPC besides their driving license. The CPC is inscribed in the Austrian driving license with the Code 95 (C95). The EU Directive stresses the "differences between current systems in certain Member States" (article 8)[2] and therefore allows different options of how to acquire the CPC i.e. mandatory classes or only completing a test for the certificate. Austria voted for the test-only option of the CPC. In April 2018, an amendment of Directive 2003/59/EC was passed by the European Parliament that has to be implemented into Austrian law by 2020 at the latest.

The initial qualification exam consists of a theoretical and a practical test. The theoretical test takes 4.5 hours for the oral and written sections. In the first part, multiple-choice questions have to be answered (60 to 80 questions, differing from province to province). In the second part of the theoretical exam, the candidates discuss real life scenarios.

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[1] https://www.ris.bka.gv.at/eli/bgbl/II/2008/139/20080502 (05.08.2019).
[2] Verordnung des Bundesministers für Verkehr, Innovation und Technologie über die Grundqualifikation und Weiterbildung der Fahrer bestimmter Fahrzeuge für den Güter- oder Personenkraftverkehr (Grundqualifikations- und Weiterbildungsverordnung – Berufskraftfahrer - GWB). Online: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:226:0004:0017:EN:PDF (05.08.2019).

For the theoretical CPC exam, the following subject areas are tested:

- Improvement of rational driving behaviour
- Optimisation of fuel consumption
- Ensuring the safety and comfort of the passengers and cargo securing
- Labour and social law regulations
- Provisions applicable to the carriage of passengers
- Health, Transport and Environmental Safety (e.g. ergonomics, behaviour in emergencies, image of the profession)
- Economic environment of road haulage and market organisation

The practical test for the CPC exam has two options: If the CPC and the practical exam for the driver's license (C/D) are pursued together, the candidate completes a 45 minute practice test (driving a vehicle) for the driving licence and afterwards continues with another 45 minutes of driving to pass the CPC qualification. If the candidate is only performing the practical exam for the initial qualification, then a 90 minutes practice test (driving a vehicle) has to be completed.

Since 1987, a three-year professional driver apprenticeship training prepares for cargo transport as well as passenger transport in Austria. This profound vocational education and training does not play an important part in Austrian professional driver training because the majority of trainees choose the CPC exam since it only asks for a theory and practical test and the trainees do not have to study professional driving for three years, but instead can just book a preparation class at an accredited training provider or study for themselves.

The final apprenticeship examination for professional driving (freight/passenger transport) also consists of a theoretical (90 minutes) and a practical test (45 minutes). The theoretical test includes the subjects:

- Applied mathematics
- Professional knowledge (e.g. contracts, transport goods, passenger transport, traffic geography, tools, maintenance, motors etc.)
- Suitability of the kinematic chain for optimised use
- Technical characteristics and functionality of safety equipment for vehicle control, wear minimisation and malfunction prevention
- Optimisation of fuel consumption
- Cargo securing and safety regulations
- social law framework conditions and regulations for road traffic
- Requirements for freight/passenger transport
- Risks of road traffic and prevention of accidents at work
- Prevention of crime and smuggling of illegal immigrants

- health protection
- Physical and mental condition
- emergencies
- image-enhancing behaviour

19.1   Recommendations

As mentioned in several ICT-INEX reports, in Austria, many driving schools offer e-learning trainings but most of them are not systematically offered and they are not accredited. There is only one provider for e-learning programmes that offers 3 theoretical training modules out of 5 for periodic CPC training in Tyrol. These modules can be acquired via e-learning (vehicle technology, social provisions, and working environments).[3] There is no difference in the price, if a module is conducted via class room training or e-learning. For the e-learning system, there are several quality standards required, e.g. the identity of the user has to be detected via webcam. As e-learning in not offered very systematically, there are no guidelines when it comes to the minimum qualifications a trainer/instructor conducting e-learning should possess. In the e-learning programme as part of the periodic CPC training offered by the accredited provider from Tyrol, no instructors are in place. The trainees have to complete 100% of the training content which encompasses 7 hours.

After scepticism towards e-learning in the beginning, most of the provincial governments in Austria see that the system works in a controlled way (webcams) and that the trainees have more freedom since they can repeat things as often as they want to. Some people see e-learning as more effective and sustainable than classroom training because the learners are more actively involved. Also employers like that e-learning is a very flexible instrument and that the training can be done whenever and wherever the trainees want to.

With regard to a high-quality integration of e-learning into regulated professional driver education and training in Austria, the following national recommendations aim to facilitate the development of quality in professional driver training[4]:

- Clear recognition of e-learning as an optional training approach within regulated training for professional drivers
- Integration of work-based learning practices into e-learning course settings in order to meet the needs and learning characteristics of professional drivers
- Full integration of e-learning into Driective 2003/59/EC through the application oa a learning outcomes approach
- Increase education-oriented quality awareness and literacy of stakeholders within professional driver training

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[3] „Fahrzeugtechnik", „Sozialvorschriften", „Arbeitsumfeld".
[4] Cf. Ball, C. (2015).

- Cooperation between all stakeholders as a key to quality development
- Quality standards for e-learning courses
- Quality standards for trainers/instructors

When it comes to integrating language support for immigrants, no concrete recommendations can be made, since the Austrian project partner 3s research laboratory did not organise its own pilot projects within the ICT-INEX project. Nevertheless, since also in Austria a big number of professional drivers are non-native German speakers, the lack of professional drivers is high like everywhere in Europe and since new groups of immigrants from Syria, Afghanistan, Irak and Africa entered the country in 2015, it seems also a very good approach for Austria to offer e-learning training programs for professional driver trainees in different languages.

20. Laws regulating training of drivers in Finland

For Finland, the following main legal regulations are reported:

- Law of driving licenses
- Law of professional qualification
- Law of road transport
- Health and driving ability
- Law on adult education-, vocational education and training

The first two laws named above are introduced as being direct legal answers to the EU legislation, namely the law of driving licenses as contribution to EU-Directive 2006/126 and the law of professional qualification as contribution to EU-Directive 2003/59. The law of road transport gains relevance by regulating in detail the driving license classes for each vehicle type. Finally, the law on adult education-, vocational education and training gives the legal framework for PD training as a part of vocational education. The legislation of vocational training does not generally take a stand on the way teaching is organized, but rather on content and quality. Distance- and/or e-learning is therefore primarily the responsibility of the training provider.

Driver training in Finland

The Professional Qualifications Directive harmonizes the minimum level of training for road haulage and passenger transport operators in EU Member States. Basic level qualifications are always acquired through formal education.
Training usually lasts for 280 hours, but can also take place under accelerated conditions under certain conditions, with a duration of 140 hours. The training includes a theory test.
The National Board of Education decides on the basics of the curriculum and the degree examination leading to a vocational qualification, and in this context confirms the basics of the curriculum and the degree examinations to be followed in initial vocational education and training. A training provider approved as a training center for initial vocational training shall comply with the criteria of the curriculum and the degree examination approved by the National Board of Education in the initial vocational education and training.
A training provider approved as a training center for initial vocational training shall be responsible for providing the training in the application for approval of the training center and in addition to the information provided and the terms of

approval. If there are any changes to the information provided in the application or other information provided by the Applicant that cause the terms and conditions of the approval as defined in the law on the professional qualifications of truck and bus drivers no longer apply, the Training Center shall immediately inform the National Board of Education.

Development of driver training

Nowadays, the driver is required to act as a heavy duty driver:
- A C driving license is required for driving a truck. The driver of a combination vehicle (truck) must have a driving license and a card of the CE vehicle category.
- The EU regulation for freight transport from new truck drivers requires a initial vocational training and already in the profession further training from 10 September 2009.
- Drivers whose driving license has commenced before 10 September 2009 are exempted from initial vocational training but further training is also exempted from initial vocational training.
- The transport operator needs a joint permit for domestic and foreign goods transport, which must be covered by a freight transport course approved by the Ministry of Transport and Communications.

There will be no changes in these requirements in the near future. In the long run, the technological development of the industry will change and develop driver training.

20.1 Recommendations

There is already a large number of e-learning applications (ie programs that can be used to study professional qualifications - basic and / or advanced - over the network) for professional driver training, but these are not yet fully operational under current legislation. The biggest problem is that the law requires, for example, 140 hours of training, but if a student is studying over the Internet, how do you verify the hours you take? And how to account for faster learners? In order to reap the full benefits of information technology and self-study, legislation should be amended so that, for example, after completing a certain number of tasks with the right answers, a person can receive a certain amount of training.

Another important point would be to distinguish between a program that requires a lot of practical training and a subject that requires more theoretical reflection from the professional driver training program. A lot of practical training subjects could be different topics related to the use of machine tools and attachments, and of course driving instruction. These can be easily transferred to a simulator for training. Topics that could include theoretical reflection could include entrepreneurship topics and, for example, vehicle technology. Again, such topics would be better

implemented with e-learning applications - perhaps even with tutor tutoring on-line (this also provides feedback for tasks that do not have a clear "yes / no" answer and thus not easy for a computer program to provide feedback on.

21.   References

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