Pilot documentation

Defensive driving simulator programme, TTS, Finland

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Lifelong
Learning
Programme

Summary

A pilot carried out a defensive drive training with simulators. There were two high-end driving simulators as well as four light-level driving simulator. Studies in practice on a daily basis on follow:

	Day 1	Day 2	Day 3
Hour 1	Introduction	Reflection continues	Reflection continues
Hour 2	familiarization to the simulators	Lesson for defensive driving	Lesson for defensive driving, cases
Hour 3	Group 1: Test drive Group 2: follow and observe	Group 1: Supervised practice Group 2: independent practice	Group 1: Test drive Group 2: Independent practice
(Lunch)			
Hour 4	Group 1: Test drive Group 2: follow and observe	Group 1: Supervised practice Group 2: independent practice	Group 1: Test drive Group 2: Independent practice
Hour 5	Group 2: Test drive Group 1: follow and observe	Group 2: Supervised practice Group 1: independent practice	Group 2: Test drive Group 1: Independent practice
Hour 6	Group 2: Test drive Group 1: follow and observe	Group 2: Supervised practice Group 1: independent practice	Group 2: Test drive Group 1: Independent practice
Hour 7	Results and reflection	Results and reflection	End conclusions

The training was implemented in two groups: for professional drivers and the basic level driver trainees. Learning outcomes of the groups were virtually unchanged from, but their transfer effect of knowledge and skills was better than in new drivers group. In our opinion is that the new drivers have no real basis for comparison yet professional transport - unlike already professionally active drivers. After the training, the student's thoughts were very positive in both groups.

During the training groups rotated from the high-end simulators, then the low-end simulators and classroom teaching. Each training day was followed by a summary and collected feedback (feedback summary in this report).

The training itself was seen as a very practical approach, a clear, systematic, and a good way to study the defensive driving in demanding traffic situations. Training results in the future will be to look at the drivers, i.e. whether the affect in to attitudes reached? And if so, how often the training is to be revised in order to maintain a positive effect? Is five-year timeline sufficient (defined in the directive)?

Education Pilot has introduced the Work Efficiency Institute (TTS) education and training provision and it is able to replace completely slippery road course exercises in bus drivers education from the very beginning of 2015 (minibus drivers has go to slippery road conditions training into the track so far, until the simulator minibus-software can be built).

Content

1. The pilot course on "TTS – Defensive driving"

1.1 Specification of the courses target group and their needs

The target group of the training was the heavy traffic drivers covered by the Professional Qualifications Directive (2003/59/EC). Among them, we select the bus drivers from the metropolitan area into the pilot training. The target group was to consist of different levels of drivers with a variable length of work experience.

Driver's backgrounds were known before the pilot training, but we did not know who had driven most crashes and whom the "champions of economic driving" were. Some of the drivers had been drivers for several years and other part was just in the basics of training.

1.2 Description of the selected instructional design approach and its rationales

For the teaching we had chosen to make a proactive driving simulator training program, the extent of three study days. We had already a theory based three-day defensive driving course, but now we wanted to see whether the same can also teach with a combined simulator and theoretical training. Our national workplace cooperation group presented that because the simulator training can include a various special situations, defensive driving training is a quite an apt subject for piloting. We found that defensive driving exercises cannot be realistically implement no elsewhere than in the simulator.

1.3 (EQF) Learning outcomes associated with the course

The course has no significance to the EQF objectives, but the students who take part to the basic level of education, training covers one part of the undergraduate degree or vocational qualification mandatory training.

The main objective of the course is to increase awareness of professional drivers, the fundamental principles of the defensive driving and learn how to avoid dangerous situations, which you can be prepared in advance. In addition, training was applied for a practical approach to defensive driving learning and teaching. The training program was expected to create clear mind-maps for urban and rural environment, where bus drivers will do their daily work.

1.4 Description of the pilot training material and overall course outline

The training material was created for the simulation training and used in a related tasks (Appendix 1) like a learning diary and for equal learning. Second part of the training material was for the instructor's and used as a teaching material (Appendix 2). The training exercises were implemented with the high-end driving simulator and some exercises with the light simulator. Training days began with the theoretically part and then continued simulation and peer learning tasks.

2. Testing of the pilot

2.1 Implementation of evaluation and testing measures

Testing methods were: instructor-led theoretical learning in the classroom, trainer-led simulator training tasks, independent peer learning, as well as learning how other students are driving in the driving simulator and independent learning in low-end simulators. The pilot project was carried out by three different groups (the results have been taken into account in the report). In the pilot we used two high-end driving simulators, as well as four low-end driving simulators. In pilot we had two simulator instructors: one for the high-end simulators and one for the low-end simulators. The tests went according to plan, and only minor corrections had to be made after the first pilot (The familiarization period in to the first day and split the group into smaller pieces). Only shortcoming of the implementation was the lack of independently working low-end simulators. Now the low-end simulators worked by instructor-led, but the tasks were rolling independently. We had also one fluke with the piloting: we managed to test the pilot with the initiating drivers and the professional drivers.

This was the experience of the best educational models for initial training and for the professional drivers.

2.2 Evaluation and testing results

The use of the test as part of initial qualification training gave the following results:

Defensive driving simulator-based training memo for 5 - 7/08/2014 implemented training pilot

Trainers:	Trainees:
Aigar Arusaar (high-end simulator and theoretical part)	LA 13/2014
Jussi Virtanen (Low-end simulators)	OPSO LA PT 13
	(Bus Driver students)

1. Observation of the first day:

Theoretical part	High-end simulator	Low-end simulator
Daily topics through varying methods.	**Group size of 15 students is a time-consuming and**	**Was made suburban tasks, where the student was**

	cumbersome, as well as instructor and students. More than 12 people groups will insist two device. On the first day of the test executables loops cut short at the end of the case so that the exercises ended on the last stop before driving the bus station in the yard.	induced by unexpected circumstances. When trainer was absent – the misbehavior starts ☺ Low-end simulator exercises are an excellent activity when the big simulator work period pending.
2. Observation of the second day:		
Theoretical part Daily topics through varying methods.	**High-end simulator** **Group size increased by 17 people (with a few trainees). Today's exercises are more observation-based. Important is that the learning outcomes can be achieved by following up.**	**Low-end simulator Emergency brake and avoidance tasks as real-world situations. Choosing the right control is emphasized in a small device.** **Students felt that the exercises were useful.**
3. Observation of the third day		
Theoretical part Daily topics through varying methods.	**High-end simulator** **On the third day running similar loops than the first. Courage and the rate had increased so the results were not quite as good: accidents happened more than in the first day.**	**Low-end simulator** **The summary-like competition - where choosing the right situation speed is important – gained great popularity. No accidents happened so the goals was reached apparently well.**

General observation :

1 Scheduling is really important when working with large groups.

2 Simulator and defensive driving instructors had been surprised about the amount of resistance to the implementation of this training model and the three day body is still not fully aware for the driving training trainers.

3 Low-end simulators and exercises must be really well designed if the equipment is intended to operate independently. This time, it was founded that the exercises are obediently as long as the trainer is there, but if he turns his back for one moment, "rally-driving" and other non-pursue action begins immediately.

4 Students feedback was very positive and in particular low-end simulator praised.

SBT defensive driving pilot 5. - 7.8.2014

Sucsess of simulator tasks (1 - 5)

Sucsess of simulator tasks (1 - 5)	Trainers success (1 - 5)
5	5
3	4
3	5
3	4
3	3
5	5
3	5
4	4
4	5
3	5
5	5
3	3
2	3

Average:	**3,54**	**Average:**	**4,31**

Student views on learning outcomes:

The vehicle mass utilization	0
identification of the dimensions of the vehicle	3
Rolling	0
Mirror usage	1
Situation speed	12
The importance of observation	11
Slip effect	12

	1. task				2. task				Kommentti
	route nr	Accidents	Time	Nausea	route nr	Accidents	Time	Nausea	
1	4		12:12		5		15:00		
2	2		10:30			1	10:00		
3	2	1	11:41		5		9		Reitiltä eksyminen.
4	4		12:28	1,00				1	
5	3		15:43	1,00	6		13:00	1	
6	6		12:00	1,00	1		16:00	0,5	
8	3		13:23		2		12:00		
9	5		10:39	0,50	4		11:30		
7	1		16:00	0,50	3		17:00	0,5	

Nausea entry 1 indicates clear motion sickness and mild nausea 0.5.
Normal lenght (12m) bus with manual
gears

For improvement
to the simulator

Theoretical part of training

First, a number of shorter mileage
driven.

Giving the feedback to administration
does not have enough time. It is in a
hurry to chase test drives through

First day test run? If the test run must do, it would be better to place small tables or at the very least a decent platforms for the second group, in order to do the tasks and assessments

The "Kamppi" bus terminal task could be removed, or be a "reserve" task. At present, the benefit of non-existent professional driver (only meaningless driving). Should add more traffic, etc.

The "Kamppi" bus terminal task couldn't do because of a lack of time - only to presentation for students + peer learning

School education needs more of a "cold facts"

3. Reflections on the courses instructional design

3.1   Professional drivers needs and characteristics

Professional drivers are used to work with their own hands, and the situations they face in traffic are very concrete. As a result, they miss the training and learning activities that are based on true situations: facts, pictures, events, etc. Exercises must be realistic, and through them to get to the correct behaviors in different situations.

3.2   Aspired learning outcomes

The pilot project was applied for good learning results for defensive driving principles and their practical way of introducing the driver's work. The current situation of defensive driving is taught drivers either purely theoretical doctrine of posts or in the driving lessons by instructors in the context of the track to practice or the fuel consumption minimization of practice (so-called economical driving consumption measurements). The carried out simulator training was to combine theory and practice together so the learning process is more efficient and the learning outcomes from practice easier. The impact of the pilot was to appear also in adopting safer driving habits, less accidents per driven kilometers. The desired learning outcomes was also to changing attitudes of drivers: it is important to drive customer friendly and to stay in schedule, but it should not control the driver's driving style/habits more dangerous and higher spending. If we can demonstrate through education, how risks increase when its rush, maybe we assume also hope to have affected the drivers' attitudes. We prefer a little late than never.

3.3   Appropriateness and contribution of the chosen instructional design approach

The design was started from assumption that the simulator can be implemented in almost realistic learning environment for both urban and rural environments and we get to train with an ability to anticipate situations that require practical examples. Is also aware the fact that many drivers are simulated exercises prejudices and they may not be able to transfer - what they have learned - to their own work. We had design the training according to the first section, which focuses only on the realism of the simulator tasks and how things were made to correspond to real life. In addition, the instruction was to include the possibility of independent application, so that students can experiment with different types of practices impact the results.

The design principle was to exercises as realistic as possible, so it also includes a less "nice" traffic situations, such as suddenly running children and animals. Some students may experience these situations of oppression, even if it is only a virtual reality. For this reason it was important that the exercises could be done over again and learn how to identify potential risk factors that may lead to negative situations in traffic (that is how to learn to anticipate the possible unpredictable behavior). We believe that this method of implementation with simulators was the best possible way for this subject.

3.4   Educational quality

We have not found the meter of educational quality measurements. Training is carried out in accordance with the requirements of the authorities of high-standard learning environments.

4. Conclusions

4.1   Improvements proposed for the pilot course

As we noted earlier, the rate was the pilot needs to make only minor changes to the first day of the course (a short 5 min familiarization to the simulator, which significantly reduced the nausea. In addition, we divided the group of several small groups to make peer learning easier (when others are following on driving performance). In the future the possibility of independent-training will increase with the low-end simulators. Pilot course material - that used for students - will made to an electronic format, so that the use of (for example) a tablet PC is successful.

4.2   A SWOT analysis of the pilot course and computer-/simulator-supported training for professional drivers in general based on the pilot experience

Strengths	Weaknesses
a practical model of education, a good framework for giving feedback, powerful and intuitive way to learn. New variety of exercises can be drawn up indefinitely. Adaptability of the exercises. Different types of vehicles to use in practices	Requires a large amount of equipment (simulators) and experienced instructors.
Opportunities	Threats
Development of technology will enable smaller simulators and training in customer premises with portable devices	If a student does not experience training "realistic" enough, then he/she may not be able to transfer to practice what they have learned. All are not able to study in a simulator for example because visual problems.

4.3   Quality considerations on technology-supported training for professional drivers drawn from the pilot implementation

Quality will play a key role in many cases, when it comes to technology subsidized education. The equipment must be able to provide students with a realistic touch experience, so that he/she could transfer it to their own work. Instructors also have an important role to play as motivating and

learning guidance. It became clear in our pilot that if the assignments are not sufficiently built or trainer supervision is missing, the exercises will become too fun for students. This is the greatest risk of independently exercises. Simulation exercises will also be prepared in such a way that they take into account the student's level (they must not be too easy or too difficult). The pilot exercises were drawn up in such a way that each of each subject has at least five to ten different exercises. Topics related to the urban environment, the anticipation in challenging situations, as well as hazard locations on roads.

4.4   Contribution of the pilot to the relevant policy framework

The pilot implementation facilitated the effective low-end simulators usage and these results are excellent conversation opener's for authorities regarding ways to define simulators. Currently, the national legislation allows only high-end simulators in use of drivers training and professional qualification training. However, the same learning outcomes is possible to get in the low-end simulators. Low-end simulators will be defined in many different levels (from laptop size to normal passenger car sized simulator). Our low-end simulators representing a higher quality level, which includes the benches, controls and large displays. This level allows, for example, very precisely implementation of the defensive driving exercises. The implementation will continue and will also allow the authorities join to follow education. Then the discussion with them can also proceed better.

4.5   Further conclusions and recommendations

All in all the pilot design and implementation have been very fruitful time for our team, because this was the first time when we planned the entire course in to a new model: the previous three days of theoretical training into a three days simulator-based model. We started also to test this simulator implementation in other training modules to amend. It is especially important to think about the simulator's strengths: versatility and performance ability, or usage in feedback. The simulator supports the use of such substances and exercises, which are meant to learn a new way to work, or in which you want to look at your own actions. The simulator also provides a lot of different measurements of driving performance, like with equipment option cameras, it can be used to examine the drivers' attention to the attachment (eg. where's the driver's gaze is directed in the murky/dark when driving and when you meet another vehicle). Mixing high-end and low-end simulators is also recommended in training as the high-end driving simulator is better for learn right vehicle controls and adjustments. Low-end simulator is more suitable for all other training, which controls of the vehicle doesn't play a central role.

Annexes

- Annex 1 Learner material
- Annex 2 Trainer material