



## Impact study and Pilot Testing Automotive e-Learning Box in HU system

## QUALITY CONTROL

As a basis of the Quality control report regarding to the Impact study and the Pilot testing, we have evaluated:

- 2 reports about the progress of the impact study: in Lukács School (theoretical) and in Tanbusz (practical)
  - 1 report about the final closing test at the end of the impact study
  - 3 summaries about the results of the pilot testing: in the 3 other schools.
- All these documents have been sent also to all the partners for checking.

### 1. Test of Hungarian e-learning beta version of Automotive LB:

The completely finished Hungarian e-learning beta version of Automotive LB have been tested in two environments.

In the two partner organisations of the project and in 3 other VET automotive schools at the same time through a Pilot Testing.

The following report represents the quality control of the **Impact study** of the **Pilot Testing**.

### 2. Impact study

#### 2.1. Impact study in the partner organisations:

Impact study has taken place in the 2 partner organisations of the project , Lukács Sándor VET School and Tansbusz garage.

The program was tested by the students, teachers and tutors.

For realizing the Impact study, the Hungarian Lukács School created two groups within one class:

- 1st group studied with the traditional HU system based on books
- 2nd group studied with the help of the Learning Box, guided by teachers and tutors

In both groups there were some 15 students and 8 teachers and 1 tutor involved.

#### 2.1. 1 Goals of the Impact study

The goal of the Impact Study has been to measure the learning efficiency of the Learning Box system, during one month of regular use, and to determine whether the LB system has positive effects on the learning results of Hungarian students or not.

The following characteristics were measured by undertaking two LB test-rounds with



students, teachers and tutors:

- Knowledge acquisition
- Convenience of way of learning
- Preference in the way of learning
- Guidance system, technical point of view

During the study, two questionnaire rounds have been undertaken:

1. Questionnaire round 1 has been undertaken after the first half of time working with the testing. It has been a kind of “in-between judgement” of students, teachers and tutors. It is used as a measurement tool for the teachers, to point out possible issues, which can then still be adjusted if necessary.
2. Questionnaire round 2 has been undertaken at the end of the testing. It is the official measurement moment, and it determines the “final conclusion” of the Impact study”.

The questionnaire rounds have been relatively similar. For one side, the questions are comparable. For the other side, the procedure for both questionnaire rounds have been alike. The procedure for both questionnaire rounds have been as follows:

- The students will complete the questionnaire together in class.
- The results will become available for the teachers and the LB participants.

#### 2.1.1.1 Impact study, 1<sup>st</sup> Questionnaire round

#### Results questionnaire round 1

##### STUDENTS (15 participants)

LB items

User-friendliness

Average marks: 1-5

Theory	4,7	learning system incl.	
Tecnical data	4,3	including track and trace system	4,5
iDocs (interactive questions)	4,7	mentoring/tutor system	3,7
Self tests	4,7	system sreens	4



Final exams	4,0	general LB structure	
Interactive training modules	4,5	(is it logical)	4,5
Mentoring/tutor system	4,0		

**Outcome (students opinion):**

- Recommendation to third persons to study with the system is 100%
- Overall positive experience with LB versus old system is 60%
- Enjoyable and easier learning experience at school/home 60%
- Positive learning experience at school/company 50%

**Quality control/ quality check on Impact (students):**

The 3 main advantage of LB system are that it is easy to use (based on Internet), funny to use and you can use it everywhere (at school, home, workplace)

It adapts better to new generations habits, based on the Internet use, and in consequence they are much more motivated to use it and to study contents.

Students can have assessments by teachers and tutors at anytime and everywhere.

Individual learning progress adapts better to students attitude (the excellent students are no longer hold back by their class mates).

Also they have a better overview about what has been learned in the past, communication between students-teachers-tutors use to be much more fluently.

Partly negative aspects may be, that it is sometimes less easy to use at home (depending on good internet connection), more difficult to show to third parties (a book is easier to show).

Also communication with teachers and tutors can be more difficult because of need to be connected to LB system

Negative aspects may be the relatively long learning period to learn to use the LB system and the cost to use it.

Overall outcome of quality check on impact is clearly positive.

Quality of system is very high, precise and updated. It is funny to use because its interactive.

Results questionnaire round 1  
TEACHERS (8 participants)



## LB items

## User-friendliness

Average marks: 1-5

Theory	4,3	learning system incl.	
Tecnical data	3,6	including track and trace system	3,9
iDocs (interactive questions)	4,4	mentoring/tutor system	3,9
Self tests	4,6	system sreens	4
Final exams	3,4	general LB structure	
Interactive training modules	4,0	(is it logical)	3,9
Mentoring/tutor system	3,8		

## Outcome (teachers opinion):

- Recommendation to other teachers to use LB system is 100%
- Improvement to existing (traditional) system is 75%
- Students effectively check their knowledge by making a self-test
- Students are more actively engaged in questions, homework, practice
- Less positive experience in theory and execution of the school related work of students
- Overall learning experience of students 86% better than traditional
- Students engage more in theory and questions
- Students remember more contents
- Easier to keep information up-to-date

**Quality control/ quality check on Impact (teachers):**

The 4 main advantages of LB system are that students engage more actively in theory and questions, self control of students of their learning progress is possible, improved communications with tutors, improved overview and control over progress of students.

There is less time for individual guidance by the teacher (this argument is logical, because the control of learning progress through LB system shifts from teacher, at old system, to student, taking control of learning progress and making his own progress control).

Nearly no difference to traditional systems are intensity of communication to students, time for individual guidance and support of learning process and the final exams.



Overall outcome of quality check on impact (for teachers) is clearly positive. Quality of system is high, precise and constantly updated.

\* Learning system, mentoring / tutor system, system screens and user- interface is very user friendly.

\* Students are more actively engaged in practice and questions

\* LB system allows to add new content from internet.

\* The quality outcome of learning process is higher that with the traditional.

One negative aspect may be the relatively long period to learn to use the LB system. Another the cost of the access to system.

Results questionnaire round 1  
TUTORS (1 participant)

LB items		User-friendliness	
Average marks: 1-5			
Theory	4,0	learning system incl.	
Tecnical data	3,0	including track and trace system	4,0
iDocs (interactive questions)	4,0	mentoring/tutor system	4,0
Self tests	0,0	system sreens	4,0
Final exams	0,0	general LB structure	
Interactive training modules	4,0	(is it logical)	5,0
Mentoring/tutor system	4,0		

Outcome (tutors opinion):

- Very high valoration of LB system to keep Theory and Practice up dated to vastly changing tecnology
- Very high valoration of LB system because there is more time for individual guidance and support of the learning process of the students at the working place

**Quality control/ quality check on Impact (tutors):**

The 3 main advantages of LB system are that

- students show more initiative to carry out their practical assignments
- LB system permits to learn on the base of an up-date information
- There is more time for individual guidance of students

There is a very big difference to traditional systems in terms of students overall learning experience in the workplace .

Students have a much more active attitude to practice and are better prepared to take decisions at time at the working place.

They arrive much better prepared to the working place.

See documents First Questionnaire round:

- TOI questionnaire students
- TOI questionnaire teachers
- TOI questionnaire tutors

## 2.1.1.2 Impact study, 2nd Questionnaire round

## Results questionnaire round 2

## STUDENTS (15 participants)

LB items

User-friendliness

Average marks: 1-5

Theory	4,6 /4,5	learning system incl.	
Tecnical data	4,0 /4,3	including track and trace system	4,6/4,5
iDocs (interactive questions)	4,5 (4,7)	mentoring/tutor system	4,4/3,7
Self tests	4,6 (4,7)	system sreens	4,5/ 4,0
Final exams	4,6 (4,0)	general LB structure	
Interactive training modules	4,5 (4,5)	(is it logical)	4,5/ 4,5



Mentoring/tutor system 3,7 (4,0)

**Quality control/ quality check on Impact (students):**

Interpretation of results: Outcome (comparison students 1st and 2nd round):

- High note on Theory
- Lower note on Técnicoal data
- Slightly lower note for Interactive questions
- High note on Self test
- Strongly improved note on Final exams
- High note on Interactive modules
- Lower note on tutor system in „Items” but much higher note in „user friendliness”
- High note on learning system in „user friendliness”
- High note on system screens and logical structure in „user friendliness”

**Quality control/ quality check on Impact (students):**

In comparison with the first quality check students have confirmed or increased in the second quality check the basic impressions of the first round.

The main differences are that with use of the system they appreciated more the quality of Theory and the possibility to use the Interactive modules through the LB system.

They also appreciate even more than in the first round the possibility to do a Self test whenever they want and therefore control better the own study progress.

In terms of „user friendliness” they have increased very much the note for the tutor system but also the note for the learning system itself and the logical structure of contents and system screens.

Also very strong improved note can be observed in Final exams.

Surprisingly less positive aspects can be seen in notes concerning Técnicoal data in tutor system „items” and in Interactive questions.

Overall outcome of both quality checks on Impact is clearly positive (students).

Positive aspects:

- \*Quality of system is very high, precise and updated.
- \* Students like to use it
- \* Students are much more motivated which results in a better study progress in time and



quality (confirmed by teachers and tutors).  
 \* Possibility to do a Self test at anytime  
 \* Adapts better to the individual learning progress

Partly negative aspects

- Dependence on good internet connection.
- Communication to teachers and tutors more difficult because of need to be connected to LB system
- Long learning period to use the LB system
- Cost of access to system

Results questionnaire round 2  
 TEACHERS (3 participants from Lukács)

LB items	User-friendliness		
Average marks: 1-5			
Theory	5,0/4,3	learning system incl.	
Tecnical data	5,0/3,6	track and trace system	4,0/3,9
iDocs (interactive questions)	4,8/4,4	mentoring/tutor system	5,0/3,9
Self tests	4,8/4,6	system sreens	4
Final exams	5,0/3,4	general LB structure	
Interactive training modules	4,0/4,0	(is it logical)	4,5/3,9
Mentoring/tutor system	5,0/3,8		

**Quality control/ quality check on Impact (teachers):**

Interpretation of results: Outcome (comparison teachers 1st and 2nd round):

General: It seems evident that the more you use the LB system the more you like its special advantages or characteristics.

Detailed:

- Strongly improved note for Técnicoal data



- Strongly improved note for Theory
- Improved note for Interactive questions
- Improved note for Self test
- Strongly improved note on Final exams
- The same note on Interactive modules
- Strongly improved note on tutor system

Suggestions to improve LB system made by teachers:

- Additional content should be free
- Effective communication between students and teachers
- The scoring is not working perfectly

There are circumstances inherent to one system or the other so then, the LB system will never have the format of books or substitute to direct and personal conversation between students and teachers.

Overall outcome of both quality checks on Impact is clearly positive (teachers).

In the 2nd round of valuation just 3 teachers took part instead of 8 teachers in the first round. This may influence the outcome of this second questionnaire round in a certain way. However we consider that the outcome is equally relevant.

Positive aspects:

- \*Quality of system is very high, precise and updated.
- \* Teachers like to use it
- \* Teachers see the students much more motivated
- \* Teachers see the learning progress of the students much higher in time and quality
- Possibility to do a Self test at anytime
- \* Adapts better to the individual learning progress

Partly negative aspects

- Dependence on good internet connection.
- Communication to teachers and tutors more difficult because of need to be connected to LB system
- Long learning period to use the LB system
- Cost of access to system

Results questionnaire round 2

TUTORS (1 participant)



LB items

User-friendliness

Average marks: 1-5

Theory	3,0/ 4,0	learning system incl.	
Tecnical data	4,0/ 3,0	track and trace system	4,0/ 4,0
iDocs (interactive questions)	3,0 / 4,0	mentoring/tutor system	3,0/ 4,0
Self tests	3,0/ 0,0	system sreens	0,0/ 4,0
Final exams	4,0/ 0,0	general LB structure	
Interactive training modules	4,0/ 4,0	(is it logical)	0,0/ 4,0
Mentoring/tutor system	3,0/ 4,0		

**Quality control/ quality check on Impact (tutors):**

Interpretation of results: Outcome (comparison tutor 1st and 2nd round):

General: The participation of just one tutor in both questionnaires makes it very difficult to have a contrasted opinion about the outcome of testing.

Detailed:

- Improved note about Técnicoal data
- Less positive note for Theory
- Less positive note for Interactive questions
- Low note for Self test
- Good note on Final exams
- Good note on Interactive modules
- Low note on tutor system

Suggestions to improov LB system made by tutor:

- Try the system in more practical cases

Final considerations of tutor

- LB system is more transparent
- LB increments quickness of learning
- Gives no way to have practical experience

This last argument is correct, however the LB system does not pretend to substitute practical learning, it just pretends to best prepare the student before starting the practical



experience.

Concerning the suggestion to try the system in more practical cases, it is just matter of time and coordination with VET schools to influence in their teaching process to have more practical cases, relevant for the tutors, to be treated in class.

Overall outcome of both quality checks (on Impact is positive (tutors).

In the 2nd round of valuation just 1 tutor took part. This limitations makes us more difficult to evaluate the outcome and do the quality control.

However we consider the outcome equally relevant.

Positive aspects:

\*Quality of system is high, precise.

\* Tutors see the students much more motivated

\* Tutors see the students much more prepared

\* As they come more prepared, there is more time for individual attention

Other aspects

Due to the strong change of consideration of items during the first and second round of questionnaires, we prefer not to go into detail. Our impression is that the outcome of implementation of the LB is still in a very early stage and therefore valuations and considerations of tutors are not enough settled.

See documents Second Questionnaire round:

- TOI questionnaire students
- TOI questionnaire teachers
- TOI questionnaire tutors

## **Final reports on Impact study**

### **R10 REPORT learning experience: Students**

#### **Summarizing the learning experiences during the impact study with The LearningBox**

The education carried out through the LearningBox was found a great novelty by the students at our school since it seemed to be a unique way in the full time training. Similar e-Learning system has been used only in adult training in the education. Consequently, the student, who reviews and gets to know the e-Learning system in the full-time training, certainly might use it later even for self-training as well.

The system was tested by the car mechanic class in their first year in the lessons of motor-vehicle constructions. The topic was concerned with the lubrication system. We chose this topic because this teaching material was relatively simple so the students were able to



acquire the use of the program besides the teaching material ignoring some minor problems. We used the Dutch material in the teaching process. The system was tried out in one half of the class, while the other half was taught in the traditional way when acquiring the chosen teaching material. The selection of the students happened at random.

Since the Dutch material was peer-reviewed by the vocational teachers after the translation, there were not found any major mistakes in the Hungarian version. The use of the programme was easily acquired by the Hungarian students because majority of the students had already passed the final examination in Information Technology. They could open the teaching material and they could connect the proper symbols to the proper content. In such a way the tutor/teacher could follow their progress and level when studying and doing their home work at home

Final conclusions of the Impact:

### **R10 Report on the Results of the Closing Test: Teachers**

Both the pilot project and the test were carried out in a test class. The number of the students in the test class was 26, and the class was divided into two groups: one of them was taught in the traditional teaching method which includes teacher's presentations as well as making notes by the students; the other group was taught through the Learning Box. The class was a car mechanic class of the 13 level, this means that the students were trained after having passed the Hungarian final examinations of the secondary school. The chosen topic was concerned with the lubrication system within the motor-vehicle constructions.

#### ***Evaluation of the closing test of the pilot project:***

The evaluation was carried out in each group of questions comparing the results in per cent of the particular type of questions in the test group and the control group.

1. It was a highly important factor in the questions containing pictures, explanations of pictures and components that the control group got a slightly different picture material during the work on the teaching material than the Learning Box user-group.

The results: <b>LB users</b>	<b>Control Group</b>
<b>89%</b>	<b>68%</b>

2. The two groups had quite a similar result in the other type of task which includes open-ended questions, however, there were a bit better results due to the use of the Learning Box.

The results: <b>LB users</b>	<b>Control Group</b>
<b>82%</b>	<b>77%</b>



3. The third type of task which consisted multiple choice questions was considered the most difficult regarding the teaching material and the preliminary studies since the students had not met such a type of task so far.

The results: <b>LB users</b>	<b>Control Group</b>
<b>76%</b>	<b>51%</b>

All in all, the test group achieved the result of **82,33%** while the control group achieved **65,33%**. The test consisted of 30 questions and all the iDoc applications were used in it.

It could be concluded on the basis of the test results, that the Learning Box means a more practice-oriented, practical teaching method which makes the industrial circumstances much closer to the students. Due to its applicability and user-friendly system the evident benefit of the Learning Box against the traditional methods was obviously proved and justified.

## **R10 REPORT**

### **Experience about practicing the Learningbox test material at Tanbusz Ltd.**

Two practical trainers – József Fábíán and Gábor Kiss - of Lukács Sándor Vocational School participated in Holland in April in connection with the practical training of the automotive curriculum developed there. According to the agreement concluded there, the Dutch colleagues have prepared the tests required for the curriculum provided which can be filled in by our trainers and trainees by downloading them from the specified links, thus providing a picture of their knowledge gained from the curriculum, its usability and usefulness.

The tests were completed by car mechanic trainees in our school on 7<sup>th</sup> June 2013. Among our trainers József Fábíán completed it on 14<sup>th</sup> June 2013; and Gábor Kiss at Tanbusz Ltd. on 16<sup>th</sup> July.

Based on the unanimous applause of our trainees, they rate the theoretical curriculum at 80-90% on a 100% scale, including the IT manageability, the assistance for preparation to exams, the regularity, logic and good transparency.

Our trainees expressively emphasized that this system is more effective than the systems and curriculums used by us.

The tutorial can be accessed faster, and can be made clear shortly.

They consider this learning method up-to-date, by highlighting the freedom of the site of studying, since they do not have to perch on the books.

József Fábíán and Gábor Kiss trainers have rated the questions required for the evaluation of the theoretical part at 70-80% on a 100% scale following the completion of the test.

This evaluation includes the knowledge needed for the completion of the exercise, the compliance of those having the knowledge and the execution of tasks.



They consider useful the upgradeability of the curriculum, the conformity of the theory and the training modules.

However, it contains less information from the basic data required for repair which could be measured well at the evaluation.

The technologies are built on each other, and their logic is perfect.

It is also capable for the cooperation with the trainer colleagues, teachers during performing the controls.

The program is easy to use, but should be developed to be simpler.

Based on the unanimous opinion of the trainees and trainers the curriculum and the tests do not include practical, repair and adjustment data, and specification, or there are only few of them, although the expectation of the European Union today is the practice-oriented training.

The results of the trainees' tests are transparent, and can be used well later for the repetition of the needed curriculum.

Conclusion:

The Dutch LearningBox automotive training materials and the LearningBox system is a key instrument for a successful and quality preparation of industrial trainees.

### 3. Pilot testing

The pilot testing was done in 3 other VET schools:

- Hunyadi Mátyás Szakképző és Szakiskola, Mosonmagyaróvár
- KECSKEMÉTI MŰSZAKI SZAKKÉPZŐ ISKOLA,  
SPECIÁLIS SZAKISKOLA ÉS KOLLÉGIUM
- Bláthy Ottó Vocational Secondary School

Results in all the three VET schools have been similar to the VET schools participating in the Impact study.

Teachers confirm that Students using the LearningBox as a new learning method could achieve much better results and could make better progress in the learning process.

In terms of Quality Control we have seen the results and outcome of the testing similar both In the Impact study as in the Pilot Testing. This confirms the sense and effectiveness of the technology transfer taken place in this project.



## **Final conclusions Quality Check on Impact Study and Pilot Testing**

Generally speaking studying with LB system is a new approach with the advantage of

- System is clear, precise and up-dated
- Quick access to information and learning contents
- User friendly system
- Students and teachers like to use it
- Students are more actively engaged in questions, homework, practice
- It permits a individual velocity of learning progress
- It allows Self control over the learning progress at any stage of the progress
- It permits teachers and tutors to know the study progress of each student at any time
- Gives teachers and tutors more time for individual learning with students
- Much more practice oriented learning method
- Students come to the working place with much more practical knowledge
- Practical knowledge comes to a higher level with LB system