



Good Practice on the Move

Part I: Good Practices for Teaching New Technologies



Co-funded by the
Erasmus+ Programme
of the European Union

Publisher & Project Coordination

BGZ Berliner Gesellschaft für
internationale Zusammenarbeit mbH
www.bgz-berlin.de

Project Partners

Innung des Kraftfahrzeuggewerbes Berlin
Hochschule für Technik und Wirtschaft
BSKFT Vienna
ANFA Paris
SCP Zagreb
PSSG Vicenza
VAVM Vilnius
ZSS Poznan
PUT Poznan

Photo Credits

© iStock.com- metamorworks (966859334)

Berlin, August 2021



Co-funded by the
Erasmus+ Programme
of the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein

INTRODUCTION	4
1. GERMANY AND ITALY LEARNING MODELS FOR E-MOBILITY – SIMULATION OF HYBRID AND ELECTRICAL FUNCTIONS (PROJECT “LEARNING E-MOBILITY PLUS”)	5
2 AUSTRIA E-MOBILITY TRAINING FOR PROFESSIONAL TECHNICIANS OF HIGH-VOLTAGE POWERTRAINS INCLUDING LEVEL 2 NATIONAL CERTIFICATION	7
3 FRANCE „PROJET INVESTISSEMENT AVENIR“– DIGITALISATION OF AUTOMOTIVE SERVICES	9
4 CROATIA LEARNING E-MOBILITY (LEMO)	11
5 LITHUANIA E-TOOL FOR CAR MECHANICS LEARNING.....	13
6 POLAND, GERMANY AND ITALY LEARNING MODEL FOR TELEMATICS IN MOTOR VEHICLES (PROJECT “CAR2LAB”)	15

Introduction

The aim of the project “Good Practice on the Move” is to show good practice approaches for the successful integration of digitalisation and innovative technologies in vocational education and training, exemplarily for the automotive sector.

A variety of tools and procedures has been developed throughout the EU in recent years – funded by Erasmus+, but also through national programmes: Concepts for adapting curricula, learning content, materials and media, but also for redesigning occupations and reducing the strict separation of vocational and higher education etc.

Within the partnership for innovation “Good Practice on the Move”, vocational training providers, universities and associations from seven EU countries joined forces and brought together promising approaches relevant for the automotive sector. The approaches have been checked in terms of operational capability, sustainability and potential for transfer and institutional anchoring across the EU.

“Good Practice on the Move” is a contribution to strengthening the quality and attractiveness of vocational training, with long-term economic and social benefits: increased competitiveness of the automotive sector, attractive employment opportunities for young skilled workers, more service quality for consumers, broad application of digital solutions to increase functionality and utility value, but also increased environmental friendliness.

The core of “Good Practice on the Move” has been international exchange and mutual learning. Partners from seven EU countries made available the approaches they use in their institutions and examined them for being suitable as European good practice and discussed potential for transfer and use. In this brochure, we present them throughout the EU.

1. Germany and Italy

Learning models for e-mobility – simulation of hybrid and electrical functions (project “Learning e-mobility plus”)

General Description

Proposal from: Institution Contact person	BGZ, Grazyna Wittgen Kfz-Innung Berlin Sebastian Niewiara Pia Società San Gaetano Alessandro Scaldaferrò	https://www.bgz-berlin.de/ , wittgen@bgz-berlin.de https://www.kfz-innung-berlin.de/ , s.niewiara@kfz-innung-berlin.de http://www.sangaetano.org/ , scaldaferrò.alessandro@sangaetano.org
GP Example	X own O if not, by whom?	A result of the Erasmus+ project “Learning e Mobility plus” under: http://emoplus.bgz-berlin.de/
Topic	Functions in the field of electromobility	Learning models for three functions in the field of electromobility 1. Power split in hybrid drives (Berlin, Germany) 2. Switching from the conventional to electro drives (Poznan, Poland) 3. Gears in hybrid and differences in technical performance (Vicenza, Italy)
What	O Technical model O Learning unit O Method X Other	Multimedia presentation of the emergence of three learning environments
Available as	O PDF X online available under: O Word version	PL: www.youtube.com/watch?v=ywbkTW-o7BA DE: www.youtube.com/watch?v=smpw2mcnRcM IT: www.youtube.com/watch?v=yvyuf33vTi0

Availability	X freely accessible O restricted, type of restriction: O available only, if ...	
Possible fields of application	X Theoretical Lessons O Laboratory O Workshop O e-Learning O Other	Accessible at all locations if Internet access is available
Language versions	German, Polish, Italian	with English subtitles
Year of creation	2015	
Costs	X free O only for postage O Price	

Good Practice Indicators

Target group/s	Trainers, apprentices, lecturers, students, and other interested parties	
Takes requirements of stakeholders into account (government, companies, politics, etc.)	Yes, support of the implementation of political guidelines	
Is innovative with respect to methods where (young) students are attracted / motivated / involved	available online, short frequencies covering the main content, three different examples from three countries	
Is a transferable method	Yes, for the visualisation of the electromobility aspects	In connection with guidelines
Is accessible and affordable	Yes, because it is easy to use	
Has a measurable positive outcome	Can be used in class and at conferences and events	

2. Austria

E-Mobility Training for Professional Technicians of High-Voltage Powertrains including Level 2 National Certification

General Description

Proposal from (Institution and contact person)	Berufsschule "Siegfried Marcus" Alfred Czaker	www.siegfried-marcus-berufsschule.at alfred@czaker.org
Source of good practice	<input checked="" type="checkbox"/> own <input type="checkbox"/> if not, by whom?	A result of my teaching at a vocational technical school, I had to devise my own material extending and elaborating on the course book used routinely: Weninger, Maier, Schubert: Alternative Antriebe – E-Mobilität (2015), Christiani, Konstanz.
Topic	Training for Professional Technicians of High-Voltage Powertrains including Level 2 National Certification	Learning module in 5 steps: 1. Basics 2. High Voltage Systems 3. General and Specific Safety Regulations 4. Legal Requirements 5. Hands-On Training
Type	<input type="checkbox"/> Technical model <input checked="" type="checkbox"/> Learning unit <input type="checkbox"/> Method <input checked="" type="checkbox"/> Other	Teaching material in the form of PowerPoint presentations
Level of availability	<input type="checkbox"/> freely accessible <input type="checkbox"/> restricted, type of restriction: <input checked="" type="checkbox"/> available only, if ...	Registered trainee or trainer
Fields of application	<input checked="" type="checkbox"/> Theoretical Lessons <input checked="" type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Workshop <input checked="" type="checkbox"/> e-Learning <input type="checkbox"/> Other	The production of e-learning material may be an outcome of the project cooperation within "GP on the Move".

Language	German and English	Translations into other languages are easily possible
Year of creation	2012 ongoing	
Costs	X free O only for postage O Price	

Good Practice Indicators

Target group/s	Trainers, trainees, apprentices, lecturers, students	
Takes requirements of stakeholders into account (government, companies, politics, etc.)	Yes, fulfills political, educational and legal guidelines	
Is innovative with respect to methods where (young) students are attracted / motivated / involved	utilizes modern technology (projectors, computer programs, video sequences, ...) and equipment (measurement devices, testers, ...)	In the event of an e-learning module being created, the contents will be available to a much larger audience
Is a transferable method	Yes, easily transferable as teaching material	Translations necessary
Is accessible and affordable	Yes, accessible via project platform without cost	
Has a measurable positive outcome	Can lead to greater numbers of certified technicians necessary in the foreseeable future	

3 France

„Projet Investissement Avenir“– Digitalisation of automotive services

General Description

Proposal from (Institution and contact person)	ANFA (Association Nationale pour la Formation Automobile) Andreas Gabriel	http://www.anfa-auto.fr/gabriela@anfa-auto.fr
Source of good practice	X own	project funded by Caisse des Dépôts
Topic	„Projet Investissement Avenir“ - Digitalisation of automotive services	Analysis of the effects of digitalization on professional profiles and activities in the automotive services sector Training and qualification design based on the results of the analysis
Type	X Studies X Training content O Course material	
Level of availability	X freely accessible O restricted, type of restriction: O available only, if ...	The outcomes will be made available upon project completion
Fields of application	O Theoretical Lessons O Laboratory O Workshop O e-Learning O Other	Freely accessible
Language	French	Training content and course material
Year of creation	2018-2023	ongoing project
Costs	X free O only for postage O Price	

Good Practice Indicators

Target group/s	Learners, teachers and trainers, professionals involved in training	
Takes requirements of stakeholders into account (government, companies, politics, etc.)	<p>The consortium consists of</p> <ul style="list-style-type: none"> • Manufacturers (and their networks of servicing companies) • Car repair companies (small businesses) • Representatives of the sector • Universities • Training centres 	
Is innovative with respect to methods where (young) students are attracted / motivated / involved	The project aims to update qualifications and training curricula and it involves a service provider specialized in innovative training design	
Is a transferable method	–The project will be tested and deployed across the whole of France (in different VET providers with different settings). Transfer to other countries is possible	
Is accessible and affordable	The intellectual output will be publicly accessible Organisations would have adapt it to their context and might have to invest in the necessary material.	
Has a measurable positive outcome	Intellectual output, studies and reports on tests.	

4 Croatia

Learning E-mobility (LEMO)

General Description

Proposal from (Institution and contact person)	SCP (Škola za cestovni promet Zagreb), Lovorka Vidić	http://www.scp.hr/ lovorka.vidic@scp.hr
Source of good practice	X own The results are available under: www.lemo-project.eu/	Video: https://youtu.be/hCSEVMBsT2U E-book chapter: https://www.lemo-project.eu/wp-content/uploads/2015/01/Electric-Vehicles1.pdf
Topic	Learning e-mobility (LEMO)	LEMO is an innovative project on the field of teaching and learning electric mobility.
Type	X Studies O Training content X Course material	The tool enables learning through e-book chapters and then upgrade that knowledge through videos.
Level of availability	X freely accessible O restricted, type of restriction: O available only, if ...	
Fields of application	O Theoretical Lessons O Laboratory O Workshop X e-Learning O Other	Training content and course material
Language	English	
Year of creation	2015	
Costs	X free O only for postage O Price	

Good Practice Indicators

Target group/s	Learners, teachers and trainers, professionals involved in training	
Takes requirements of stakeholders into account (government, companies, politics, etc.)		
Is innovative with respect to methods where (young) students are attracted / motivated / involved	It is attractive because of its digital form (e-book chapter and videos). Also, students are able to check how much they have learned after watching video.	
Is a transferable method	Yes, easily transferable as teaching material	
Is accessible and affordable	Yes, accessible via project platform without cost	
Has a measurable positive outcome	Can lead to greater numbers of certified technicians necessary in the foreseeable future	

5 Lithuania

E-tool for car mechanics learning

General Description

Proposal from (Institution and contact person)	VAVM (Vilnius School of Car mechanics and Business) Lilija Pusvaskiene Tadas Ragauskas	http://www.vavm.lt/ projektai.vavm@gmail.com
Source of good practice	X own O if not, by whom?	
Topic	E-tool for car mechanics learning	E-learning material with theory for pupils, material for teachers, tasks with multimedia examples, tests and automatic checking and monitoring system
Type	O Technical model X Learning unit X Method O Other	
Level of availability	O PDF X online available under: O Word version	http://autoemokymas.lt/
Availability	freely accessible O restricted, type of restriction: X available only, if ...	It's available for all Lithuanian vocational school teachers and pupils, that have programs for car mechanics and electromechanics. Interested teachers from other institutions and abroad should apply for the password of the platform and can get access to the material for the indicated period of time.
Fields of application	X Theoretical Lessons O Laboratory O Workshop X e-Learning O Other	On e-learning platform we have theoretical lessons, material for pupils and various tests to check if the material is understood.
Language	Lithuanian	No translation required for visual elements the platform

Year of creation	E-tool for learning was created in 2015	
Costs	X free O only for postage O Price	It's free for all Lithuanian vocational school teachers and pupils, that have programs for car mechanics and electromechanics. It is free for the interested specialists abroad.

Good Practice Indicators

Target group/s	Pupils, teachers of vocational schools	
Takes requirements of stakeholders into account (government, companies, politics, etc.)	E-learning tool has been created for all Lithuanian vocational schools. Task of EU structural funds manager – to create the e-learning tool that can be shared and used by many VET providers.	
Is innovative with respect to methods where (young) students are attracted / motivated / involved	E-learning tool is the tool for learning and making exercises, tests, exam tasks. It helps to share same topics and information. As this is online tool, pupils are attracted and motivated to use it, they are involved during the lessons, they do exercises and tasks at separate PC having direct contact with the teacher.	
Is a transferable method	Yes, our school shares it with all vocational schools in Lithuania and can share with interested specialists abroad.	The access code is given for the limited period of time.
Is accessible and affordable	At present it is accessible and easy to use for every member of the target group.	
Has a measurable positive outcome	Helps pupils to study innovatively and to prepare for the final exam tasks.	

6 Poland, Germany and Italy

Learning model for telematics in motor vehicles (project “Car2Lab”)

General Description

<p>Proposal from (Institution and contact person)</p>	<p>HTW Berlin, Prof. Dr.-Ing. Michael Lindemann Kfz-Innung Berlin, Sebastian Niewiara ZSS Poznan, Marek Gabrylewicz Pia Società San Gaetano, Dr. Roberta Peloso</p>	<p>https://www.htw-berlin.de/, Michael.Lindemann@HTW-Berlin.de</p> <p>www.kfz-innung-berlin.de, S.Niewiara@kfz-innung-berlin.de</p> <p>www.samochodowka.edu.pl, marek.gabrylewicz@samochodowka.edu.pl</p> <p>http://www.sangaetano.org/, peloso.roberta@sangaetano.org</p>
<p>Source of good practice</p>	<p>X own O if not, by whom?</p>	<p>Results of the Erasmus+ project Car2Lab available under: https://car2lab.eu/en/157/results-and-products/</p> <ol style="list-style-type: none"> 1. VET-curriculum learning unit vehicle telematics 2. Telematics-kit 3. Telematics-box 4. Learning units & didactical manual telematics module 5. Telematics module Bachelor & guidelines use telematics-kit in higher education 6. Conclusions & recommendations
<p>Topic</p>	<p>Car2Lab (Learning model for telematics in motor vehicles)</p>	<p>Car2Lab: In this project, a telematics kit (hardware) including a web server including a web server with learning units for in-company and university-based training was developed.</p> <p>The experience from this project has shown that even complicated learning models for training can be successfully developed in an international and cross-training context.</p>

Type	<input type="radio"/> Technical model <input checked="" type="radio"/> Learning unit <input type="radio"/> Method <input checked="" type="radio"/> Other	
Level of availability	<input checked="" type="radio"/> freely accessible <input type="radio"/> restricted, type of restriction: <input type="radio"/> available only, if ...	
Fields of application	<input checked="" type="radio"/> Theoretical Lessons <input type="radio"/> Laboratory <input type="radio"/> Workshop <input type="radio"/> e-Learning <input type="radio"/> Other	
Language	English, German, Danish, Italian, Polish	
Year of creation	2019	
Costs	<input checked="" type="radio"/> free <input type="radio"/> only for postage <input type="radio"/> Price	

Good Practice Indicators

Target group/s	Trainers, trainees, apprentices, lecturers, students	
Takes requirements of stakeholders into account (government, companies, politics, etc.)	Yes, fulfills political, educational and legal guidelines	
Is innovative with respect to methods where (young) students are attracted / motivated / involved	<p>It breaks down the supposed separation between mechanics and ICT in automotive engineering</p> <p>Through the model, trainees and Bachelor students may learn practically in telematics applications in motor vehicles</p>	.
Is a transferable method	Yes, easily transferable as teaching material (Translations necessary)	
Is accessible and affordable	Yes, accessible via project platform without cost	
Has a measurable positive outcome	Can lead to greater numbers of certified technicians necessary in the foreseeable future	

Project Partnership

Germany

BGZ Berliner Gesellschaft für internationale Zusammenarbeit mbH
Pohlstraße 67
DE - 10785 Berlin
Telefon: +49 (30) 80 99 41 11
Telefax: +49 (30) 80 99 41 20
info@bgz-berlin.de
www.bgz-berlin.de



www.htw-berlin.de



www.kfz-innung-berlin.de

Austria



www.siegfried-marcus-berufsschule.at

Croatia



www.scp.hr

France



www.anfa-auto.fr

Italy



www.sangaetano.org

Lithuania



www.vavm.lt

Poland



www.put.poznan.pl



www.samochodowka.edu.pl