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CROSS-MEDIA TRAINING CONCEPTS FOR THE SWIFT KNOWLEDGE TRANSFER OF COMPLEX LIFE-CYCLE-ASSESSMENT GUIDELINES FOR ELECTRIC VEHICLES

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ABSTRACT

Within the eLCAr project new knowledge in the field of LCM is created: Guidelines based on the ILCD Handbook, tailored to the needs of LCA practitioners in the field of electric vehicles. Additionally, a set of training materials was produced and applied within this project. The materials consider individual learning preferences. In consequence, a cross-media training concept based on a blended approach of different media types has been developed: Self-learning script, seminar training and e-learning media. All media follows the same modular outline, thus allowing switching between and combining the different training media. This flexible set-up allows an optimised knowledge transfer and thereby enriches the outcome of the newly created eLCAr guidelines.

INTRODUCTION

Topics and issues from the field of Life Cycle Management (LCM), like new concepts, regulations and standards, are often complex. Their correct and successful implementation requires a good understanding and knowledge. An insufficient infrastructure for knowledge transfer often prevents to fully benefit from new and innovative topics and issues.

Within the E-Mobility Life Cycle Assessment Recommendations project[1] (eLCAr), guidelines for the Life Cycle Assessment (LCA) of electric vehicles based on the framework established by the International Reference Life Cycle Data System (ILCD; European Commission, 2010) were developed to support LCA practitioners in the European Green Cars Initiative (EGCI; European Economic Recovery Plan, 2008). In addition, the guidelines were formulated to create a common framework concerning methodological choices for LCAs of electric vehicles that will ultimately enhance the quality of studies performed within the EGCI. To achieve this, the general guidance provided by the ILCD Handbook was tailored to the specific case of electric vehicles. While these tailored guidelines are the major outcome, to promote their accessibility and allow for a swift dissemination, a training concept was developed in line

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with the eLCAr guidelines. The development of the training concept refers to the core question of this poster presentation: How to enable a swift dissemination and knowledge transfer of complex Life-Cycle-Assessment guidelines for electric vehicles? This set of training materials was designed for an optimised knowledge transfer taking into account the variety of possible users. Within the cross-media training concept of the eLCAr project, a blended approach of different media types (Kitchenham, 2011) was developed including self-learning script, seminar training and e-learning media. The training modes follow the same modular outline, thus allowing switching between and combining the different training media. Trainers are provided with the necessary infrastructure and materials to perform target group specific trainings. Self-learners are enabled to gain the new knowledge according to their individual preferences. This flexible set-up allows for a swift knowledge transfer and thereby enriches the outcome of the newly created eLCAr guidelines for LCA of electric vehicles.

CROSS-MEDIA CONCEPT

The didactical structure of the cross-media training concept is designed for an optimised knowledge transfer and to address all possible applicants within the EGCI. Thus, the development of the training materials started with the definition of the target group. As a consequence different training modes were developed (Brookfield, 2013). In addition, the training concept follows a modular approach whenever possible to count in the different needs and pre-existing knowledge within the target group.

Target Group

The main target group of the developed training materials are practitioners from EGCI projects. All potential training participants and learners have in common basic background knowledge of LCA and/or electric vehicles and their components. Still, they may have different approaches and background knowledge in terms of LCA methodology, technical background, experiences in certain electric vehicle component assessment or full vehicle assessment. The target group includes LCA experts with little knowledge on electric vehicles as well as experts on e-mobility who are new to LCA. The training materials can be used by learners who need to conduct an LCA study as well as those who are looking for basic knowledge in order to understand the outcomes.

Modular Approach

The eLCAr training concept follows a modular approach (see Fig. 1), meaning that the content of every part of the training can be accessed individually (Ambrose, 2010). Where possible, every module is designed as a self-contained unit so that it can be understood based on knowing the fundamentals of LCA. Thus the modules can be assessed in any order.

For more experienced users, the modular approach, offers the possibility to take short cuts to complete the training more quickly or to assess only the topics they want to focus on.

Figure 1: Modular approach, ©ifu

Training Modes

The target group differs not only in background knowledge but can be segmented further according to different learning preferences: Whereas some individuals may prefer to learn as a group in seminar trainings, others prefer to learn on their own with accompanying training materials (Moreno & Mayer, 1999). Consequently, different training modes were developed to meet these preferences.

In general, all training types aim at supporting written information with graphical representation wherever possible to facilitate a good memorising of the content. Moreover, all training modes include interactive elements to help deepen the newly acquired knowledge (Driscoll, 2002). The interactive elements sometimes vary between the offered learning modes. For instance, questions animating group discussions are mainly anchored in materials for seminar trainings. Nevertheless, sometimes similar questions also appear in the self-learning script. Depending on the demands of the target group customising the interactive part is possible so that it fits best to the given conditions is possible.

To take into account that the potential target group not only differ in its background knowledge but also in its preferences about how to learn, the training materials concept includes a set of different training modes, following a modular approach. Besides the seminar training mode, a self-learning script and e-learning is offered (see Fig. 2).

For learners who prefer to assess new topics together with others, the *seminar training* is a suitable learning method (Laszlo, 2006). The seminar training is one of the cornerstones in the offered training concept for the eLCAr project. Goal of the provided seminar training materials was to develop an infrastructure that facilitates trainers to conduct seminars. This infrastructure includes: presentation slides including all necessary information; presentation texts providing import information that should be included in the oral presentation of the slides; group exercises to be conducted by the seminar participants.

Figure 2: Training modes, ©ifu

The *self-learning script* is a working book that offers exercises related to the different modules of the training concept (Harrison, 1999). Exercises for different level of learners are included. For all tasks, sample answers are given in the annex and additional information (e.g. links to interesting papers or websites) is included for almost modules.

The *e-learning* is made available via the web platform 'moodle' (Rice, 2011). For every module, a so called Web-based-training (WBT) is available. A WBT is principally a power-point presentation combined with narration (Driscoll, 2002). The user himself clicks through

the slides so that the speed is always appropriate. So-called quick-tests are provided after each module as interactive elements to check the submitted knowledge. Additionally a forum can be assessed to get in contact with other learners to discuss questions or to exchange knowledge and experiences.

A supplementary training mode is the trainer-accompanied eLearning (Arnold, 2013). Here, a copy of the moodle is made available for a trainer. Thereby, the trainer enrols participants and can adjust the contents according to the layout of the course.

CONCLUSIONS

In the eLCAr project, training materials were developed in line with the actual project outcome, the guidelines, to enable a swift dissemination and knowledge transfer. First tests during stakeholder workshops revealed a positive reaction to the cross-media training concept. Still, the impact and results of the selected approach have to be evaluated after the launch of the training materials together with the publishing of the new eLCAr Guidelines.

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