Introducing a New Dimension in the Professionalization of Trainers in Railway Services

Description of a successful cooperation between the University of Applied Sciences St. Pölten and the University College of Teacher Education in Lower Austria

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Abstract

The University of Applied Sciences St. Pölten started the unique training program "Academic Trainer in Railway Services" in collaboration with the University College of Teacher Education in Lower Austria. This innovative program is based on two modules in which pedagogical skills, rail related topics as well as interpersonal skills are trained. Within three semesters the students gain new knowledge and improve skills they already have acquired and which they are using on the job. Due to the fact that the program is designed in close cooperation between ÖBB (Österreichische Bundesbahnen/Austrian Federal Railways) and their academic partners, the students' needs can be taken into consideration to a high degree. In addition to this, the program fulfils the requirements of the international certification DIN EN ISO/IEC 17024. This article explains the curriculum in detail and provides insight into the main ideas of the cooperation. Moreover, lessons learnt are discussed and first results of an accompanying research project are presented.

1 Introduction

In 2012 the Austrian Federal Railways (Österreichische Bundesbahnen, ÖBB) were looking for a profound education program for their workplace trainers to fulfil the requirement of the international certification DIN EN ISO/IEC 17024. This had become necessary because international standards were required for services offered to an international market. Instead of just sending their trainers to special courses to get the certification, ÖBB wanted to take the opportunity to offer a training program that goes far beyond the content and competences that are needed to acquire the certification. Together with the University of Applied Sciences in St. Pölten and with the support of the University College of Teacher Education in Lower Austria and the University College of Teacher Education of Christian Churches Vienna/Krems the unique training program "Academic Trainer in Railway Services" was developed and the first course started in 2013.

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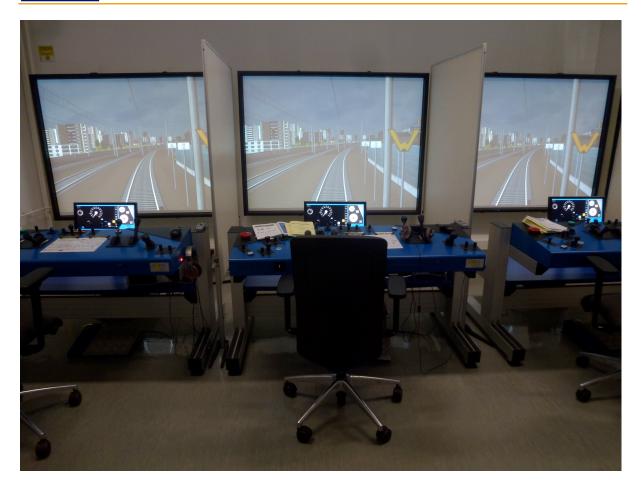
Figure 1: Training on the workplace

2 Design of the Training Programme

2.1 Aim of the Programme

The target group of the course are people who teach adults in internal trainings in or for railway companies. Knowledge and skills in the areas of

- preparation and delivery of content
- course and seminar planning,
- course and workshop design,
- personal strengths and diversity of methods and
- presentation skills and media use

are taught in a three-semester course.

The course also serves as a preparation for the certification "Specialist Trainer" in accordance with ISO 17024. Therefore the curriculum was designed in a way that the content complies with the requirements of ISO 17024. The certification is administered by an officially accredited certification body.

In addition, the successful completion of this course allows admission to the examination "Workplace Trainer" in vocational education. The actual examination, however, is not part of this course.

2.2 A Look at the Curriculum

The course is based on two modules: "Module 1 – Trainer Competences" and "Module 2 – Railway Competences".

Module 1 provides knowledge and skills for independent implementation of teaching with regard the purposes of adult education. This includes, for example, the specific context of in-house training (teaching participants between 20 and 55 years of age with varying knowledge, linguistic and cultural backgrounds, or social skills).

With this module the participants get to know about the latest models on adult education and are enabled to integrate them into their personal learning concept. They learn to plan seminars and courses, to select the best ways in making use of the necessary or available tools, to apply the appropriate test methodologies, and to perform quality assurance.

In addition, they gain experience in scientific processing of a research question independently.

Module 2 links various disciplines and contextualizes previously acquired knowledge in a meaningful way. The participants learn to design integrative approaches and to implement them in practice. They are able to optimize their own teaching and their leadership based on their project management know-how and their basic knowledge about teamwork. Moreover, they learn to transfer their professional competences into teaching. Participants acquire experience in working on scientific topics and themes with regard to teaching in the field of railways. Finally, they demonstrate that they are able to prepare the content of a chosen topic and select methods of teaching independently. Any knowledge acquired is put into practice, self-assessed and shared through reflective feedback.

The following tables 1 and 2 give an overview of the subjects in the modules.

Subject	ECTS
Basics of Learning Theories and Adult Education	1.5
Instructional Design Planning	1.5
Methodology and Didactics	1
Securing Learning Transfer	1
Designing Exams	2
Quality Assurance and Evaluation of Courses	1.5
IT-based Learning	1
Law in Apprenticeship	1
Academic Study Skills	3
Scientific Paper	10

Table 1: Module 1 "Trainer Competences"

Subject	ECTS
Presentation Techniques and New Media	1
Moderation and Other Interactive Group Management Techniques	1
Competence Assessment	3
Business English	4.5
Rail English	4
International Railway Law	1
Project Management	3
Interdisciplinary Project	10
Work Placement	9

Table 2: Module 2 "Railway Competences"

2.3   Requirements

According to the certification, there are entry requirements for the lecturers, especially for module 1. These include the accomplishment of vocational education, professional qualifications such as teacher training degrees, degrees in pedagogy from universities or colleges of teacher education, coach/inside training, or coach/inside further education (100 lessons) in addition to professional practice demonstrated by work experience (at least 5 years) and practice as trainers (3 years or 100 lessons). These requirements are meant to guarantee a high level of training quality in correspondence to the academic level of the course.

3   Accompanying Research

Trainers in the Austrian Railways hold in-house courses and trainings on operational issues (e.g. training for drivers, safety training for board staff). At the same time the trainers evaluate the participants' knowledge and skills through administering tests. Sometimes these tests are administered by different trainers. The tests have not been standardized yet which is why the trainers impact the content and the methodological design of the test significantly. They decide which competences and learning objectives are to be tested and which tasks are to be at which levels of competency. They also decide about the test method, the level, and length. Standardized professional competence examinations (Winther, 2010), have recently gained status in vocational education and training (e.g. VET-LSA Large-scale assessments in the field of vocational training) (Achtenhagen & Baethge, 2007), following large-scale studies in general education (e.g. PISA shock in Germany 2001, in Austria 2003).

About 6,000 tests are held in the ÖBB in Austria each year. Of these, about 2200 are performed exclusively orally with a duration of 20 to 30 minutes. About 600 written tests last one-half to one and a half hours. About 3,200 exams have practical and oral components. These tests take about 30 minutes per candidate. In total there are 100 test persons in Austria, of which about 40 are employed by the ÖBB. There are 70 skilled trainers working in Austria, 35 are ÖBB employees. In addition, the ÖBB still employ about 150 instructors, who cover a smaller area of responsibility and mainly serve as technical managers. The professional trainers, who usually also take over testing functions, work 38.5 hours a week. They teach or examine for about 32 hours and devote the remaining 6.5 hours to preparation and to the reviewing of lessons and tests.

The interest of the accompanying research lies in the exploration and collection of test methods (Ebbinghaus, 2009) applied in practice and in identifying the subjective theories on which these are based. Furthermore there is an interest in the structure of knowledge (Schratz, Paseka & Schrittesser, 2011) and learning and learning objectives in an educational context (Bloom & Engelhart, 1973; Möller, 1976). The research focuses primarily on the description and understanding of the subjective theories of skilled trainers.

The central research questions are:
(a) How do trainers check the students' levels of competence?
(b) Which test methods do they apply?
(c) Which subjective theories about the structure of knowledge do they hold?

The starting point is the assumption of modern examination formats in vocational education (Ebbinghaus, 2009), three classical theories of learning (Bodenmann, Perrez & Schär, 2011), as well as theories of the structure of knowledge in the context of professionalization in teaching professions (Schratz, Paseka & Schrittesser, 2011). Theoretically reclaimed aspects to subjective theories (Patry, 2011, pp 27-44) with respect to planning, course implementation, and knowledge or skills of reproduction (Niedermair, 2012) provide additional information and indicators for the deductive creation of a category scheme (Mayring, 2008). This is the starting point for the development of a guide for problem-centered interviews and a moderation concept for group discussion with the trainers and lecturers.

The analysis of the group discussion using the documentary method (Bohnsack, 2010) allows the elaboration of explicit and implicit considerations, assumptions and premises of the trainers for their selection and design of tests, the visualization of the subjective theories of the trainers and their collective orientations for learning, knowledge, teaching and testing.

The splitting of weekly working hours of skilled trainers shows that the time for didactic preparation and review is too short compared to teaching or testing time on the formal administration level. The results indicate that the trainers mostly test orally in seminar rooms as well as practically and orally with simulators and in real life situations. Oral and practical-oral examinations are most frequent and are usually carried out in small groups of 3 to 5 tests persons.

Normally there are between two and five tasks or questions per candidate. Tests usually last between 20 and 30 minutes per candidate.

The examination papers or exam questions are not standardized; each examiner asks their individual questions. In the tests, the required three principles according to Ebbinghaus (2009) are only partly taken into consideration.

The principle of practicality is respected by case-based discussions and practical tasks. The principle of action orientation is only occasionally considered because hardly any complex tasks are set and related to work, tasks are only set occasionally.

The principle of process orientation is not followed strictly, because there are no tests over a longer period. Consequently, there are no operational projects, comprehensive assignments, specialized tasks, or situational duties. Trainers stick to their subjective theories of learning, which are based on behaviorism (stimulus-response learning) and cognitivism (instruction learning), while constructivist learning (learning by creating an individual representation of the world) in the educational setting of teaching and testing is not taken into account.

The learning objectives, which are usually only implicitly present, only consider the cognitive and in some cases the psychomotoric dimension. The affective side of learning objectives is not a didactic category of skilled trainers. Of the six levels of taxonomy (Bloom & Engelhart, 1973) only the first three are taught and tested (knowledge, comprehension, application), the stages four to six (analysis, synthesis, evaluation) are not considered.

The results so far show that the ÖBB-trainers' teaching and testing are mostly based on behaviorist and cognitivist theories of learning and declarative knowledge and not aligned with the state-of-the-art of modern adult education. The situation is paradoxical: Trainers want to develop skills and competences, but they primarily teach and check declarative knowledge. It is assumed that the learning setting will improve if the trainers increase their personal didactic methodical repertoire. Thus, they will create more opportunities for "extra-teaching" and gain time to design more and more standardized tests for their students.

4 Conclusion

The first participants of this course showed considerable commitment and reported direct implementation of course contents (didactic methods) in their own training. Each participant carried out a small scale research project and presented it within final oral exams.

The accompanying study has identified that the previously practiced teaching and testing in the trainers' daily work does not align with the state-of-the-art of modern adult education. It is mostly based on behaviorist and cognitivist theories of learning and declarative knowledge. On the one hand, trainers want to develop skills and competences, but on the other they primarily teach and check declarative knowledge. The learning setting will improve if the trainers increase their personal didactic methodical repertoire. Only then will they create more space for "extra-teaching" and be able to generate standardized tests for their students.

Finally, it can be said that this new course, including the design of the course in close cooperation between ÖBB, the University of Applied Sciences in St. Pölten and the University College of Teacher Education in Lower Austria has brought about a substantial professionalization of trainers in Railway Services. Instead of attending many individual short term seminars, the participants were studying for three semesters in a compact training program with a coordinated curriculum including high-level lecturers. These components created high value training which the trainers could apply immediately in practice to improve their daily work.

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