

TrainSpot2

Challenges and opportunities for the development of a network infrastructure for adult and continuing education

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urn:nbn:de:0009-5-57759

Zusammenfassung

Das Verbund-Projekt ‚TrainSpot2‘ hat zum Ziel, einen Train-The-Trainer Hotspot zur Erfassung, Entwicklung und Zertifizierung von Kompetenzen zu gestalten, der an die Digitale Vernetzungsinfrastruktur Bildung angeschlossen wird. Mit dem Train-the-Trainer Hotspot wird eine Infrastruktur geschaffen, um Lehrenden in der Erwachsenenbildung/ Weiterbildung eine bedarfsgerechte und gezielte Nutzung miteinander verzahnter Bildungsangebote zur Kompetenzentwicklung zu ermöglichen. Basierend auf einer Betrachtung der Ausgangslage, beleuchtet der Beitrag die mit dem Vorhaben verbundenen Fragen zu einheitlichen Referenzmodellen und Standards sowie zur Rolle der Lernenden und deren KI-basierte Lernunterstützung in ihren Chancen und Grenzen. Darauf aufbauend werden mögliche Ansätze zur Gestaltung einer interoperablen und adaptiven Infrastruktur präsentiert.

Stichwörter: e-learning, Train-The-Trainer-Hotspot, Vernetzungsinfrastruktur, Kompetenzrahmen, individuelles und selbstgesteuertes Lernen, Erwachsenen- und Weiterbildung

Abstract

The aim of the joint project 'TrainSpot2' is to design a train-the-trainer hotspot for assessing, developing, and certifying competencies, which will be connected to the digital network infrastructure for education. With the hotspot, an infrastructure is being created to enable teachers in adult and continuing education to use linked competency development offers in a demand-oriented and targeted manner. Based on a consideration of the initial situation, the article examines the project-related questions regarding unified reference models and standards as well as the role of learners and their AI-based learning support in terms of opportunities and limitations. Based on this, possible approaches to the design of an interoperable and adaptive infrastructure are presented.

Keywords: e-learning, train-the-trainer hotspot, network infrastructure, competency framework, individual and self-directed learning, adult and continuing education (ACE)

1. Introduction

The digital network infrastructure for education is intended to create an infrastructure that links together existing digital education offerings and platforms in the digital education space and makes them accessible to learners via a single access point. As a central location for AI-supported, individual, and self-directed lifelong learning, the digital education space includes the contexts of schools, universities, and adult and continuing education (ACE). The education ecosystem will be based on open standards, common formats, and interoperable structures that enable metadata and learner data to be exchanged among each other and merged into one user account.

In the course of building the networking infrastructure, research and development projects are being funded to establish digital education offerings compatible with the digital network infrastructure for education. TrainSpot2 [1] represents one of the funded projects. It aims to develop a train-the-trainer hotspot for the in-service skills acquisition of ACE teachers and to connect it to the digital network infrastructure for education. In an association of the German Institute for Adult Education (DIE), the Eberhard Karls University of Tübingen (EKUT), the Technical University of Lübeck (THL), the WBS Training AG (WBS), and the RWTH Aachen University (RWTHA), learning offers of different nature and at the same time typical for the landscape of ACE are brought together, which creates a versatile and scalable offer consisting of open courses (THL), courses for a limited group of participants in company continuing education (WBS), and self-learning offerings with (DIE) and without (EKUT) Open Educational Resources licenses.

The challenges for the development of the train-the-trainer hotspot are not only the technical linking of the participating partners ACE offers and the connection of the hotspot to the digital network infrastructure for education, but also the definition of a common reference framework and usage scenarios for a self-directed acquisition of competencies.

Given the heterogeneous provider landscape of ACE and the different prerequisites and interests of the target group of teachers, a design-based research approach (Reinmann, 2005) was chosen in which representatives of the target group and other providers are involved as development partners and a project-accompanying evaluation of the emerging concepts and prototypical implementations takes place to develop a solution that is as user-oriented and highly scalable as possible.

2. Initial situation, goals, and current stage

For the competency development of teachers in ACE, challenges arise from the design of learning offers regarding the heterogeneous learning prerequisites as well as – in part precarious – working conditions of the target group, which often operates on a freelance basis (Autorengruppe wb-personalmonitor, 2016). This requires non-proprietary, open, and individual learning approaches that cover a broad range of topics and levels. A high participation rate can be expected if the learning offers can be easily integrated into everyday working life, are accessible at low thresholds, and are flexible in terms of time and location. Therefore, approaches to individualized and self-directed learning in digital learning environments seem promising. The existing – mostly provider-specific and thus

exclusive – ACE offerings for competency development (Schrader, 2010, p. 54), are often based on stage models of expertise development, are linear in structure, and do not take sufficient account of the differential competency profiles of the teachers.

Derived from these preliminary remarks the main objectives of the project entail practical utilization for the field of ACE as well as scientific research interests. In providing assessment, development, and documentation of competencies in one interoperable socio-technical network infrastructure the project first and foremost is about establishing connections between actors and elements that are so far rather isolated or detached from one another. Network infrastructures are hardly found in ACE to date. Furthermore, the investigation of the conditions of success for the development of such infrastructures is a field that has been little researched until now. Thus, the project represents an innovative approach of added value for the established practice.

Reaching halftime of the two-year project, the technical and conceptual foundations for implementing the goals have been laid. We defined user stories and derive meta and functional requirements in focus groups with pedagogical and technical experts. This phase is now followed by the concrete development.

3. Description of the target product

The train-the-trainer hotspot will enable teachers to plan, design, and document their in-service competency development via the course search and the data wallet of the digital network infrastructure for education. For this purpose, the MOOC learning offers "Digital Trainer" (= DT), part of the Futurelearnlab (FLL) of the THL, the self-learning offer "Online Case Laboratory" (= OFL) of the EKUT, the Trainer Continuing Education Program of the WBS, the EULE self-learning offer of the DIE, as well as the wb-web knowledge modules of the DIE, will be connected to the digital network infrastructure for education to make them interoperable.

Technically, the architecture consists of an OpenID Connect Provider (Keycloak), a cloud cluster managed by Kubernetes, and an AI service connected with Learning Record Stores. It is possible to connect external Learning Management Systems like EULE, OFL, FLL, and WBS but also other data sources, via Proxis. The Proxis generates the necessary xAPI statements to store and process the learning record of the learners. All participating ACE offerings will be enhanced with technical features that can be reused by providers on the digital network infrastructure for education and outside after TrainSpot2 is complete. The connecting features that can be used across platforms will include a content mapping tool, a tool for reflecting on learning requirements, assessments for checking competencies, digital evidence for documenting competencies, and a visualized competency balance.

In terms of content, the train-the-trainer hotspot represents a competency-oriented and cross-platform infrastructure for promoting the individual development of professional competencies. Following the shift from status-oriented profession to development-oriented professionalization (Nittel, 2010; Helsper & Tippelt, 2011), this competency-based approach has long been considered suitable and necessary to ensure the quality of teaching and learning in ACE (Schrader, 2010; Schrader, 2018, p. 54f.). Therefore the development of pedagogical competencies as well as the validation of (non-formal and informal) acquired skills are becoming more important (Gruber & Wiesner, 2012; Duvekot et al., 2020). In the

discourse about the professional competency of teachers, the assumption is shared that there is a core set of pedagogical competencies that are "generic" in the sense that they are relevant to the success of learning regardless of the object of teaching (content) and the deployment scenario (e.g., school, company) (Schrader, 2010; Marx et al., 2017). In this context, the participating ACE offerings take over the above-mentioned central features for competency acquisition dividedly: a) knowledge building, e.g. with wb-web knowledge modules, knowledge-based parts of the DT or the EULE learning paths or the WBS training program, b) action training through task processing in the context of the WBS training program, and c) reflection based on casework in the OFL of EKUT.

4. Development challenges

We develop the technical solution following a design-based research approach (Reinmann, 2005). To ensure a high level of target orientation, it is worth investing time in a careful exploration of possible scenarios. In the process of developing user stories and conducting focus groups, we identified two major challenges addressed within the following questions:

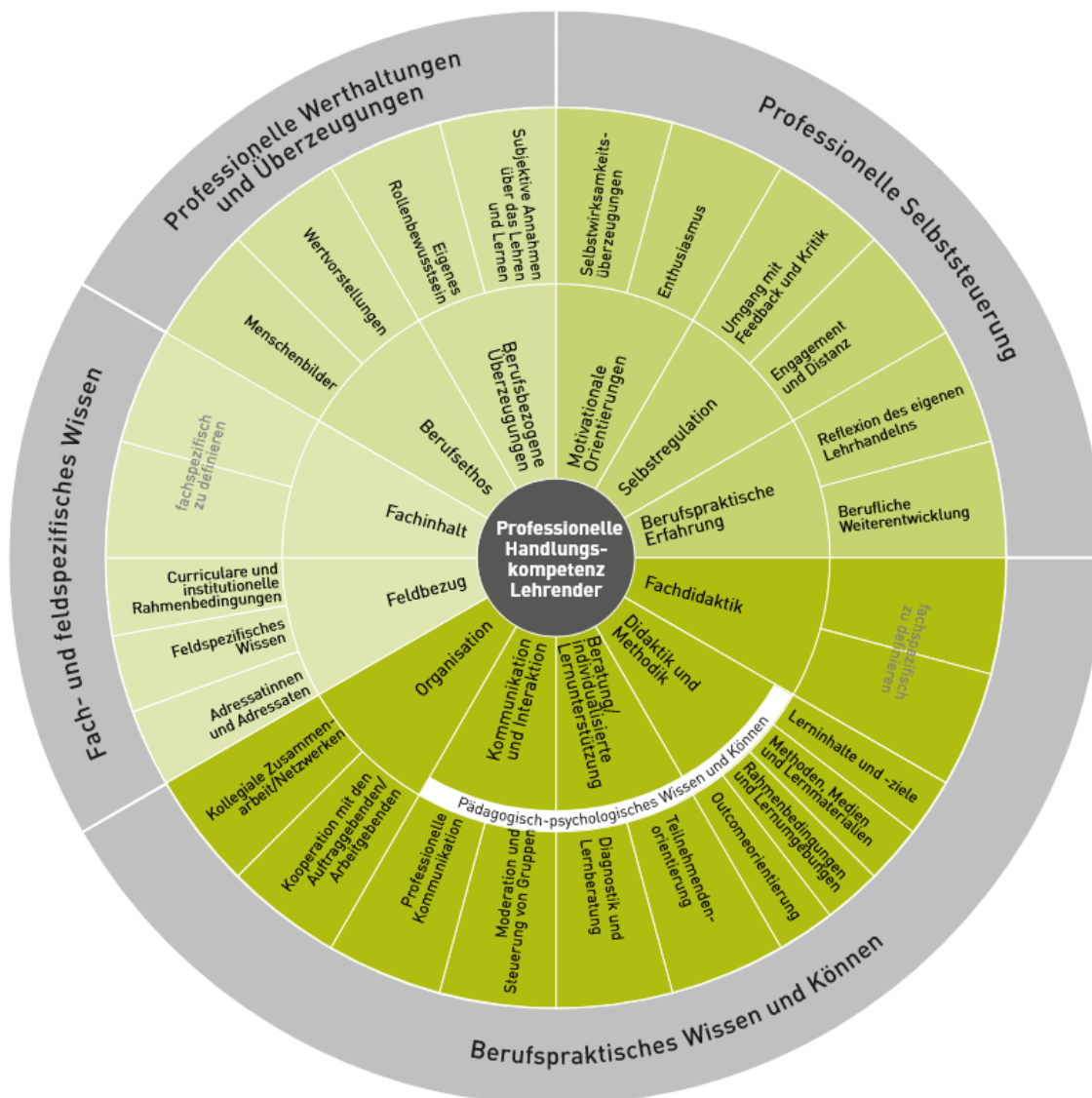
How a joint reference framework and interoperable system of competency meta-data can look like?

How individualized and self-directed use of the features and learning content can be well supported by AI components?

4.1 Joint reference framework and interoperable system of competency meta-data

If generic knowledge and skills are the focus of the promotion of competencies, existing domain- or occupation-related competency models do not appear to be very adaptable. Furthermore, there are no generally recognized certificates in ACE.

To establish the train-the-trainer hotspot a generic and by the relevant ACE associations accepted competency model must be chosen as a common reference framework. The GRETA competency model (Lencer & Strauch, 2016) is a cross-training reference model that is based on the current state of the discussion about the required competencies of teachers in a school context (Baumert & Kunter, 2011) and has been adapted to the particularities of the context of ACE. However, it is not only developed on a scientific basis but it has also been validated in exchange with practitioners. This generic structural model displays all competencies and knowledge that ACE teachers need to professionally deal with in their everyday work, from planning and organizing to facilitating and evaluating learning offers (fig. 1). The model can be used for staff selection, to demonstrate teaching competencies in quality management procedures, and as a reference model for a competency-based design of teacher training. For the train-the-trainer hotspot, the GRETA model acts further as a basis for the implemented features connecting assessment, visualization, and development of competencies.



F 1: GRETA Competency Model

4.2 Individualized and self-directed use of the features and learning content can be well supported by AI components

If we look at the literature on the design of intelligent, individualized learning spaces, it becomes clear that technical aspects dominate, but didactic requirements for the integration of AI systems are hardly addressed (Kerres & Buntins, 2020). If these are the starting points for the integration of AI systems, reflection on the intended role of the learners and the sustainability of the algorithms used should be central (Schwertz, 2014, p. 556ff.). We consider the provision of individualized learning opportunities based on different learning prerequisites and learning preferences as a requirement and seek solutions that can take into account the heterogeneous starting points of different ACE platforms in terms of the focus of the content offered as well as the available object metadata and learner

data. This will result in flexibly designed services that are understood as extensions of existing ACE platforms and are robust in the procedures and rules used concerning the (non)use of partial data sets or the fundamental (de)activation of learning recommendations by the users.

Regarding adult learning a constructivist approach, which organizes the learning process in a self-directed and problem-oriented way, and which places the adult learner at the center of a learning process (Kerres, 2018, p. 145f.), seems to be promising under the described conditions. Nonetheless, and consistent with moderate constructivism, instructional support is also needed as digital learning environments and self-directed learning have their own prerequisites (Kerres, 2018, p. 145f.). Therefore, the features and AI System should be developed in the sense of a partnership between human and AI and support learning, while providing assistance and reasoning so that ACE teachers are more aware of their potential needs, can choose according to their current demands and in line with their level of expertise and experience (Bogwardt, 2020, p. 38). Against this background, the project offers rich and in-depth testing and experimentation opportunities for the use of AI in learning platforms and provides insights that can be seminal for scientific discourse and future applications.

5. Conclusion and outlook

TrainSpot2 enables access to various ACE offerings and interoperable learning state reflection and documentation. The competency model as well as the metadata standards will also be discussed across educational domains and made interoperable with models of other professions and contexts so that they can be structure-building on the digital network infrastructure for education. The project can be seen as an attempt to explore the chances and risks of an approach to individual professionalization of ACE teachers in a prototype environment which can potentially provide enabling and sustainable structures for upscaling later on. Connecting the ACE offerings to the digital network infrastructure for education increases their reach and tends to make them accessible to teachers from other educational sectors and attractive for further training concerning generic competencies.

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[1] The joint project TrainSpot, led by the German Institute for Adult Education - Leibniz Center for Lifelong Learning e.V., aims at connecting a train-the-trainer hotspot to the digital network infrastructure for education. In a six-month conception phase, TrainSpot1 first created the technical connection of an offer for the qualification of adult education teaching staff (EULE learning area on wb-web) of the German Institute for Adult Education to the digital network infrastructure for education. In the two-year implementation phase of TrainSpot2, a train-the-trainer hotspot for ACE will be established, which includes the multiplication of the digital network infrastructure for education concerns into the practical field.