AN ONLINE PLATFORM FOR SUPPORTING LOGISTICS TEACHERS

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Abstract: This research aims to answer how logistics teachers can be supported by a purpose-built online platform. The research takes place within the "Research and Education on Transport Logistics" (RETrans) initiative. The initiative's mission is to build a competence centre for transport logistics in cooperation with stakeholders from research, industry, and the public sector to promote logistics professions. The heart of the project is its open online platform, which provides information and learning materials on various subjects in transport logistics. Different instruments, such as curricula analysis, expert workshops, surveys and analysis of secondary data, have contributed to the online platform's design. This work presents the ongoing RETrans initiative and discusses future requirements for transferring logistics knowledge through an open online platform.

Keywords: online platform, future competencies, logistics

1. INTRODUCTION

Digitalization and the so-called "Industry 4.0" represent major challenges for the transport and logistics industry. The media, academia, research and industry discuss the future implications of digitalization and Industry 4.0 as being controversial. On the one hand, potential future key technologies and some improvements to working conditions are expected. Smart assistance systems will release workers from having to perform routine tasks, enabling them to focus on creative, value-added activities. In view of the impending shortage of skilled workers, this will allow older workers to extend their working lives and remain productive for a longer time. On the other hand, job losses and further de-industrialization are feared to the same extent [1].

Transport and logistics are likely to become some of the most important application fields for digitalization. No other industry is facing fundamental changes to this extent caused by actual rapid technological progress in the near future. This is because almost all significant technological and societal challenges are directly or indirectly linked to logistics and efficient supply chain management [2]. In summary, training on the competences and skills essential for creating transport and logistics processes becomes increasingly important to secure a transport company's long-term success. Consequently, the challenges mentioned above, along with globalization, increased complexity, rising customer demands, advancing competitive pressure and a rougher market, will require appropriate training methods and learning systems. Those are to address not only the different needs of the various skill levels but also the varying requirements of the broad and extremely diverse transport and logistics sector.

2. OBJECTIVES AND METHODS

Logistics is no longer mainly based on routine procedures. The advent of new technologies, digitalization, the increasing complexity and dynamism of markets as well as the economic environment are putting new demands upon logistics companies, in turn making them increasingly dependent on the skills of its current and future workforce [3]. Employee skills and competences play a central role in the long-term success of companies and supply chains [4] [5]. In order to increase the transport and logistics industry's attractiveness for future employees, companies must present themselves as attractive employers and stand out from other logistics services providers on the labour market [6]. On the other hand, another possible approach is to arouse interest in logistics as early as possible and to address pupils with appropriate instruments. Consequently, how can knowledge be transferred to the secondary sector, so that topics such as sustainable transport and innovative logistics can be taught with high quality and to create a positive approach to the industry? Hence, the Research and Education on Transport Logistics (RETrans) initiative was developed on the assumption that suitable teaching materials and additional offerings, which teachers can easily integrate into their education, can provide a basis for the high-level training of future employees and simultaneously support the attractiveness of field logistics occupations.

A multi-stage approach was used for this project's research design. Initially, methods relevant to logistics education that are particularly suitable for conveying logistical content were identified in a literature analysis. In the following, curricula were analysed by comprehensively gathering detailed information about logistics training at Austrian secondary schools (general education and vocational secondary schools). The derived information forms a starting point for the design of individual teaching materials. A concept for transferring logistics knowledge in the secondary school sector was created based on

appropriate teaching methods for transferring logistics content and on content-related requirements resulting from the curricula analysis.

A Web-based learning platform on transport logistics (www.retrans.at) was developed with four independent sub-pages containing detailed information on road (www.reroad.at), rail (www.rerail.at) and inland waterway (www.rewway.at) transport as well as eco-friendly transport (www.reecotrans.at).

The core target groups are teachers as well as individuals who are either undergoing professional reorientation or are already working in the logistics field (lifelong learners). Teachers have a wide repertoire of teaching methods at their disposal, ranging from smaller staging techniques, such as the integration of video contributions, the use of newspaper articles or the discussion of practical problem situations, to larger offerings in order to enable varied, participative teaching. Other forms of teaching and learning can also be used, such as lectures by teachers, lectures by pupils, artistic forms of work (e.g. creating collages), forms of documentation and research (e.g. Internet research) and learning games [7]. In logistics training, too, using diverse teaching methods can have a non-negligible influence on the lessons' success. For example, methods such as simulations, business games, case studies and smaller practical projects can be applied. Pupils should come into early contact with practice or with practical incidents or problems as part of their logistics training in order to adequately prepare them for later professional activities or training. For this reason, methods such as case studies, small business games, presentations by practical experts and excursions for logistics training are highly important. Business games and case studies in particular can significantly contribute to the acquisition of technical, social and methodological skills due to the planned group work [8].

Therefore, three approaches were chosen to effectively pursue the objectives of RETrans: the provision of various teaching materials, teacher training and different kinds of support from the logistics industry. Various teaching materials are made available on the online platform, which can be used and passed on free of charge, such as presentations, lecture notes, case studies, exercises, videos, and links to relevant homepages. The provided materials can be used by different school types and adapted to the specific requirements of educational institutions. Bearing in mind that adolescents and young adults show varying knowledge levels about transport logistics, the platform was divided into a general-information main page on transport logistics and professions in logistics as well as four sub-pages with specific information and teaching materials.
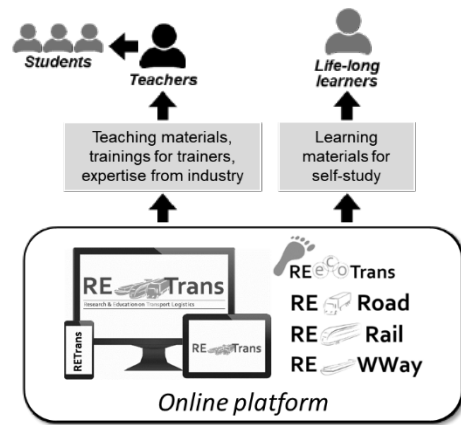

Image 1: Online platform RETrans

The "Train-the-Trainer" instrument is implemented in two ways. First, an online manual provides an overview of the contents offered on the Web platform and in the four mentioned information areas. In addition, this handbook also contains recommendations for integrating the content into teaching based on the curriculum analysis carried out. In the online handbook, teaching and competence objectives were derived from the curricula and compared with the content of the various teaching-material packages.

In addition, workshops are offered for teachers in which the content is adapted to the teachers' respective needs and content knowledge, and, above all, in which the handling of the content and its integration into the classroom are demonstrated. The workshops can also be attended in combination with a train-the-students workshop held by logistics teachers from universities of applied sciences or by practitioners from industrial or logistics companies. In this way, teachers should be given as flexible access as possible to the corresponding train-the-trainer offerings, thus promoting the broadest possible integration of the available materials into the classroom. A third possibility to support teachers in teaching logistics content in class is to invite practice experts to the school for an expert lecture or to organize an excursion with the pupils to a logistics company.

E-learning can be defined as access to learning using technological tools that are Web-based, Web-distributed or Web-capable; in a wider sense, e-learning not only covers content and instructional methods delivered via CD-ROM, the Internet or an Intranet but also by audio- and videotape, satellite broadcast and interactive TV [9]. An extensive range of software and tools exists to enrich digital learning and teaching. RETrans does not aim to provide a learning environment or organize online events, as other online learning platforms do, but primarily to provide freely available teaching materials and support for their use. A further distinguishing feature from platforms such as Moodle is that it is not primarily the learners themselves who are directly addressed. The core target audience is those who impart learning content, to offer them support in transmitting the content.

3. FUTURE DEVELOPMENTS

As previously described, the logistics industry is undergoing a dynamic transformation, driven by technological and business innovations as well as a changing economic, ecological and social environment. More specifically, the megatrend of digitalization strongly affects the logistics sector. Examples of such transformations range from electronic marketplaces to big data analytics, robotics, automation and self-driving vehicles. This ongoing transformation is having significant impacts on the required competencies of labour. Existing job profiles are changing, and new professions are arising. Consequently, the online platform RETrans has to take changing requirements into account to effectively support future-oriented training. In other words, it is essential to know which competencies will become more important for graduates of logistics-oriented school educations. This should facilitate the further development of RETrans.

It can be assumed that logistics teachers have expertise about trends in logistics as well as a good knowledge about the typical jobs of their graduates. Thus, in January 2019, teachers from Austrian schools focusing on logistics were invited to a workshop. The nine participants have been asked which competencies will be most important for their graduates in the future. The Transportation, Distribution, and Logistics Competency Model of the Employment and Training Administration (United States Department of Labor) was applied as a framework with which to answer the question in a structured way [10]. The competency model describes the required competencies for successful performance in the transportation and logistics industry. Image 2 shows the slightly adopted model, which consists of five tiers.
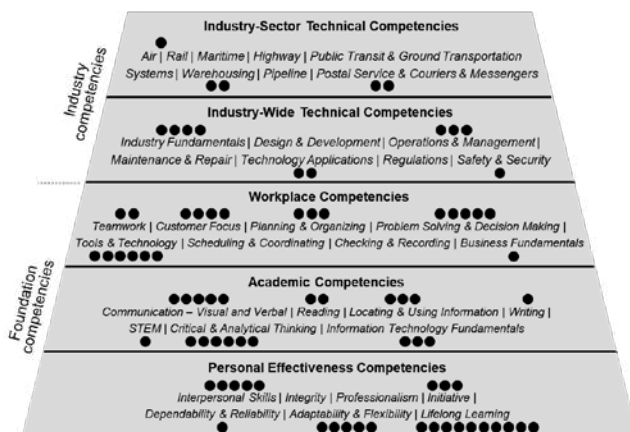

Image 2: Future requirements

A higher tier represents a higher level of specialization in the application of skills. The lowest three tiers contain the foundational competencies required to enter the workplace. The tiers of the foundational competencies refer to personal skills, the ability to learn and the ability to work. The top two tiers comprise industry competencies, which are specific to the logistics industry or its sectors. Each participant was asked to distribute nine points among the model's competencies according to his or her assumption about the relative increase of each competence's importance in the future. Different weights could be expressed by assigning zero, one or several points to a

particular competence. The results are illustrated in Image 2, with the black dots showing the teachers' assigned points. These results cannot be considered as a concluding assessment but should be seen as initial guidance. The following conclusions can be drawn.

(1) The point distribution clearly favours the foundational competencies. Only 19 percent of the points were assigned to the industry competencies. At the moment, the online platform RETrans primarily addresses industry-specific competencies. In the future, content related to foundation competencies may become more important.

(2) Lifelong learning was the highest rated competence. The platform's main focus is to support teachers with teaching materials for their courses. Additionally, the platform can be used for self-study. The platform's focus may shift to self-study activities in the future, in order to increasingly support lifelong learning.

(3) "Problem solving and decision making" together with "critical and analytical thinking" accounted for almost 14 percent of the points, for a relatively high proportion. Such competencies can be effectively developed through case studies. The online platform already offers a choice of case studies, which may be further extended.

4. CONCLUSION

Among other domains, logistics in particular is facing new information-technology challenges due to increasing digitalization. Meeting customer requirements in the B2B and B2C sectors in terms of deliverability, delivery reliability and availability put increasing importance on IT in logistics. Traditional companies, but also logistics start-ups, need well-trained staff at all levels. The competition for these (the "war for talents") is expected to intensify over the course of digitization, with initiatives such as RETrans gaining importance. It can be assumed that an earlier transfer of logistical knowledge is desirable to arouse interest in the transport and logistics sector and to position companies as future attractive employers. This can be realized by providing easy-to-use, high-quality teaching materials for teachers, expert lectures at schools, workshops and visits, as well as for train-the-trainer activities.

Despite this project's potential benefits, its limitations also need mentioning. The RETrans project is still in its infancy, and no quantifiable evaluation has yet been made on it.

Nevertheless, work is being done to further develop RETrans, such as based on the workshop described in this article and on feedback discussions with teachers who use RETrans learning materials in their classes. The focus here is on expanding the platform by further developing learning materials that strengthen problem-solving and decision-making competences, critical and analytical thinking as well as foundational competencies. Additionally, the platform's self-study activities can be further developed to increasingly support lifelong learning.

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