Digital Literacy as Cross-sectional Competence in VET – A Case Study of a Network of German Vocational Schools.

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Abstract (600 words)

Digital technologies are driving forces for change which is described as a process of "digital transformation" (Vial, 2019). It requires vocational education and training (VET) to adapt consequently. Despite the generally acknowledged need to address it in VET, profound organisational changes are not (yet) visible (Dobricki, Evi-Colombo, & Cattaneo, 2020). ICT skills are relatively well researched, particularly in ICT-related areas (Achtenhagen & Achtenhagen, 2019). There are studies of the use of digital media in teaching and learning in VET. But there is a lack of research on digital literacy as a cross-curricular area and as an integral element of school development.

For us, "[d]igital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy" (UNESCO Institute for Statistics, 2018), p.6). Digital literacy has become a key concern linked to technological developments in our "mediatized societies" (Hepp & Krotz, 2014). Digital literacy is more than just one's skill using a technology application. It is a way of thinking about how technology can become a tool for problem-solving (Erstad & Gilje, 2008), including a critical reflexive process of its social, economical and legal framework conditions.

German vocational schools tend to provide better access to ICT infrastructure for teaching and learning when compared to other schools. This often leads to the assumption that it coincides with broader use. So far, there are only preliminary studies, and only available in German (Schmid, Goertz, & Behrens, 2016). As vocational schools are focused on job preparation, the promotion of process knowledge, operating skills and industry-specific application systems are predominant in teaching and learning. Digital literacy played a subordinate role. In their 2016 strategy paper "Education in the Digital World", the Standing Conference of the Ministers of Education and Cultural Affairs of the Laender (KMK), has fixated the commitment that all students will acquire "digital competences" in six core areas (KMK, 2016a): (1) search and process; (2) communicate and cooperate; (3) produce and present; (4) protect and act securely; (5) solve problems and (6) analyse and reflect. For VET, the KMK specified: "The goal of vocational education and training is the acquisition of a comprehensive set of competences for action, whereby the acquisition of these competences should be designed as an interdisciplinary cross-sectional task within the context of digital working and business processes." (KMK, 2016b), p. 1).

In our project we worked with a network of ten vocational schools all across Germany over two years. We evaluated the school development process of integrating digital literacy across

the curriculum and how embed it into everday practices. The schools presented a variety of strategies and concepts to integrate digital literacy. Our survey showed that more than half of the teachers are familiar with the KMK competence areas. A quarter of the teachers stated that they had developed a didactical concept to support digital literacy. It was often developed in teamwork, on their own initiative and outside working hours. As expected, the KMK competences most frequently mentioned were core areas 1 and 3. Much less relevant (20 per cent) are aspects of algorithmic literacy (core area 5) and critical-reflective use of digital media (core area 6). The professional exchange was highly appreciated by the participating teachers. The cross-school cooperation was promoted by the joint work in groups and resulted in the creation of practice-oriented, open access material.

Methods (400 words

To investigate our research questions we combined qualitative and quantitative methods and accompanied the workshops with our own input and feedback to the schools. We visited all schools and conducted online surveys of staff at the beginning and end of the project. The objectives of the project were to identify examples of good practice with regard to the digital transformation of vocational schools and to stimulate networking and material development among vocational schools. With a total of four workshop meetings were held to create networks among schools and to develop materials for teachers of vocational schools.

The workshop participants were asked by an online survey twice. Here, we will focus on the final survey and the qualitative interviews conducted during the school visits. The final survey is based on a high response rate of 26 per cent (319 teachers at ten workshop schools), which can be attributed to the high level of commitment of those involved in the project. After the brief initial survey outlined an initial picture of the participating workshop schools, the more comprehensive final survey focused on teachers' attitudes and beliefs, assessment practices and implementation of the KMK standards.

Our team visited each of the ten workshop schools in the period before and after the second workshop meeting. On site, we conducted expert interviews with the school leadership and with IT administrators. The main focus of the expert interview with the school management and the focus groups with teachers was on the above-mentioned profile areas. It was preceded by more general questions on digitisation and media education at the workshop school. We organised a tour of the school which was documented with photos. The tour of the school was guided by observing the practical implementation of the technology plan. Classrooms, labs, teachers' rooms and other facilities were visited as well.

Conclusions (300 words)

Our sample of ten high-profiled vocational schools which had to undergo a competitive application process to be part of the network is not representative for Germany. But from this group we can deduce the big challenges which VET in general and vocational schools in particluar will face in the next decade to deal with digital transformation. Even in these pioneer schools, the everyday practice has not change that much. The integration of digital literacy throughout the curriculum as an interdisciplinary cross-sectional task is still in its infancy. The focus remains on the use of ICT to support ICT-related vocational areas.

We also identified a few stakeholders as drivers of change. Mostly out of personal interest, they themselves take part in additional training courses and continued their training inde-

pendently. They are the ones who contribute with innovative ideas to support digital literacy and they initiated knowledge management processes within the school. As known from prior research, it remains a key task for school leadership in order to organise a sustainable school development process. Without a broader staff development process, digitalization will not reach every part of the school, and hence not every student. Dealing with digital transformation is a school-wide activity to jointly identify strengths and weaknesses for teaching and learning.

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