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Bridging Educational Research and Practice: Meta-Research on Digitalization in Education

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Abstract

Empirical educational research investigates implications and effects of digital technology in various fields of education. In this context, the German Federal Ministry of Education and Research, is funding a range of projects on digitization in the fields of primary, secondary, vocational, higher and adult education. Furthermore, a 5-year "meta-project" has been established to accompany these research projects. It is responsible for supporting the projects, for integrating and publishing results of the projects and for advising the ministry in the advancement of policies. The paper will position the rationale of meta-research as an approach to design-b[1]ased research in education. It will focus on the dialogical measures of this approach and reflect on first experiences.

Background

The mainstream of educational research is devoted to quantitative and qualitative approaches analyzing individual learning, education institutions and underlaying social process from an interdisciplinary perspective mainly relating to philosophy, psychology and sociology. These analyses provide models and theories to better understand how learning and education function and what are relevant dimensions to explain diversity and inequity. In the 1990s, large scale assessments were started internationally that allow to monitor and compare learning achievements in common subjects in secondary schools. For some participating states, the results of the PISA and other assessments – discussed by a wider public – led to frustration: In these cases, the self-perception of a culture valuing education highly (and spending high amounts of money in education) did not match the results of these tests. This experience motivated a wide discussion of measure to take to improve the quality of learning in schools. Numerous suggestions were brought up by politicians, researchers as well as from the broader public and discussed in the media. Interestingly, these suggestions – based on the same results – could be completely contradictory and all starting points for change seemed plausible: school buildings, curricula, nutrition, teacher training – anything could be argued for. These discussions also showed that the measurement of learning achievements, though illuminating, does not provide sufficient information about possible mechanisms for change. Even more basic, if a plausible model existed explaining the causes and effects of a social phenomenon it is not obvious how to draw a conclusion about the best ways to implement change.

As a consequence of the “PISA-shock“, several public measures for research have been setup. A recent evaluation of the program on empirical educational research by the German Federal Ministry of Education and Research revealed the limited impact of this

research to the public discussion and changes in the educational system. Therefore, starting in 2018 the Ministry started a new framework for empirical research in education with a distinct focus on change projects, design based approaches and the analyses of success factors for change. In this context, the Ministry is funding a range of (ca. 60) large projects on digitalization in the various fields of primary, secondary, vocational, higher and adult education. Furthermore, a 5-year "meta-project" has been established to accompany these research projects. It is responsible for supporting the projects, for integrating and publishing results of the projects and for advising the ministry in the advancement of policies. Essentially, the meta-project wants to contribute to the advancement the methodology of design-based research as a means to intensify dialogue between educational research, practice and policy.

The meta-project in the field of digitalization in education

The learning lab of University of Duisburg-Essen is responsible for the meta-project in the field of digitalization in education, accompanying and supporting the projects sponsored in this line of research. Furthermore, the meta-project – based on a network of several university and national institutes – is devoted to the joint development of a methodology of design-based research. The meta-project accompanies the projects of the main research area, which range from basic questions and conditions of success through the design of educational processes to the question of the necessary competences for the active participation in education and society in the age of digitization. It contributes to putting the current projects of the research focus and further funding lines for "digitalization" in the framework program "Empirical Educational Research" into an overarching scientific and social framework, prepares developments in the research field scientifically, identifies research gaps and promotes the networking of the scientists with each other and the exchange with educational practice. It reflects in particular on the creation of design-oriented educational research and its knowledge communication, which contributes equally to the formation of theory and knowledge within science as well as to problem-solving in the fields of educational practice and policy. It aims to further develop the methodology of design-oriented educational research. "Transfer" is not understood as a follow-up activity at the end of the project, but as an integral part of the interaction of actors, which is to be organized as a dialogue between research projects and educational practice and policy. Results of the funded as well as other research projects are processed and central research questions dealt with from a meta-perspective. The activities of the meta-project are designed in a complementary way to the transfer activities that are anchored in the projects. The meta-project supports transfer activities of the projects and generates attention and visibility for the project work.

Educational practice presents itself differently structured in the different educational stages or sectors and different actors have to be included. The meta-project focuses on educational organizations in different sectors: primary, secondary, vocational, higher and adult education. The institutional frameworks, concepts, conditions for success and implications of digital education differ considerably in the individual sectors and the interfaces between formal, non-formal and informal learning change depending on the stage of life (even under the conditions of digitization). For this purpose, a consortium was formed for the meta-project, whose partners bring in special expertise´s to the various sectors and, consequently, to different stages of life. The meta-project on “digitalization in education” is a joint effort of the national Leibniz-Institutes of

Educational Research (DIPF, Frankfurt), of Adult Education (DIE, Bonn) and of Knowledge Media (IWM, Tübingen) with the management at the Learning Lab of University Duisburg-Essen. The presentation will more deeply explain the concept of meta-projects in educational research and its relevance to develop design-based approaches in the field of education on a national scale.

Design oriented educational research and its communication

At its core, the meta-project deals with the fundamental question of how educational research can exploit the potential of digitization for the various educational sectors and thus shape the future of "education in the digital world". The traditional view of project work is based on providing project results - after completion of a project - in a transfer phase "of practice". The transfer problem in the context of pilot projects oft he federal state commission was already discussed at the end of the 1980s and was one of the main reasons why funding for individual pilot projects was abandoned in favor of programme funding (Nickolaus, Gönnenwein, & Petsch, 2010). Approaches to transfer as unidirectional communication (from research to practice) are too short-sighted and do not meet the demands mentioned. Fischer et al. (2005) called for "benefit-inspired basic research", as formulated in the considerations of design or development-oriented educational research. Reinmann (2005) explained that in a traditional understanding of empirical research, the development of a design precedes research and does not contain any independent scientific knowledge (see also Preussler, Schiefner-Rohs, & Kerres, 2014; Tulodziecki, Grafe, & Herzig, 2013). Under the keyword design based research, a group of researchers (DBR Collective, 2003) outlined a procedure that provides for iterations of an optimization of interventions and artefacts (cf. Barab & Squire, 2004). The approach of Design Based Implementation Research focuses on participative strategies in the introduction of learning innovations (Fishman, 2014). Prediger & Link (2012) present the approach of a learning process-focused didactic development research, which mediates between the poles research and development. Whereas the traditional views of scholarly knowledge dissemination perceive “transfer” as an activity taking place after research has been completed, the meta-project wants to foster a view to transfer as an ongoing activity interwoven in all phases of research beginning from the development of research questions, the design of a research project, the implementation and interpretation of results to the communication in the field. Therefore, the major task of this meta-research is directed to the organization of communication between stakeholders in the field: identifying relevant stakeholders, developing strategies and measures to address them and intensify bidirectional communication in analog and digital settings, which contributes equally to theory building in the community of researchers as well as to the communication of experiences on solutions in the fields of educational practice.

The Paper addresses the question as to how such considerations can be implemented in the context of digitization projects, since these essentially relate to teaching and learning worlds in the future. Corresponding approaches to a methodology of design-oriented educational research that require further elaboration are available (Akker, Gravemeijer, McKenney, & Nieveen, 2006; McKenney & Reeves, 2013Tulodziecki et al., 2013). The paper will position the rationale of meta-research as an approach to design-based research in education. It will focus on the dialogical measures of this approach - as a joint effort of five partner institutions covering the various sectors of education - and reflect on first experiences. In particular, it reflects the creation of a design oriented

educational research and its communication, which contributes equally to the formation of theory and knowledge within science as well as to test solutions in the fields of educational practice and the question, how the transfer of research results into practice can be shaped and how science and society can actively communicate with each other.

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