EDeR

Educational Design Research

Volume 4 | Issue 1 | 2020 | Article 29

Contribution Editorial Article

Title **Editorial: Challenging Design-Based Research**

Author **Tina Emmler**
University of Paderborn
Germany

Dieter Euler
University of St. Gallen
Switzerland

Hubert Ertl
University of Paderborn
Germany

Keywords Design-Based Research
Cooperation
Participation
Practitioners
Researchers
Scientific Community

DOI dx.doi.org/10.15460/eder.4.1.1557

Citation Emmler, T. (2020). Editorial: Challenging Design-Based Research, *4*(1), 1-9. http://dx.doi.org/10.15460/eder.4.1.1557

Editorial: Challenging Design-Based Research

Tina Emmler, Dieter Euler, Hubert Ertl

1.0 Design-Based Research (DBR) in the Research Landscape

For the past 20 years, concepts such as "design experiments" (Brown, 1992), development research (Van den Akker, 1999), "formative research" (Newman, 1990), and "educational design research" (McKenney & Reeves, 2012) have been discussed within a research orientation that can be summarized under the generic term "design-based research." This research is characterized by the requirement that the development of innovative solutions for practical educational problems should dovetail with the acquisition of scientific knowledge. Accordingly, design-based research is defined as "the systematic study of designing, developing and evaluating educational interventions (such as programs, teaching-learning strategies and materials, products and systems) as solutions for complex problems in educational practice, which also aims at advancing our knowledge about the characteristics of these interventions and the processes of designing and developing them" (Plomp, 2007, 13). Some years before the adoption of the US discussion by Sloane (1992) and Euler (1994) in the early 1990s, business education practiced and published research concepts that aimed to connect the three focal areas, namely theory formation, theory testing, and theory application. Although the majority of the projects was carried out in the teaching and learning research spheres, the design-based research approach can also be applied to problem areas in other educational research fields (e.g. curriculum development and teacher training).

The design-based research objective is to contribute to the development of "innovative educational environments" (Brown, 1992, 141) and simultaneously develop theories with practical relevance. Consequently, it commences with the search for and identification of significant problems in concrete practical contexts whose solutions demand an innovative approach. In terms of interventions, these solution approaches are not generally adopted, but still need to be developed. The aim is thus to find innovative practical solutions for unsolved problems. "Design experiments differ from most educational research, because they do not study what exists; they study what could be" (Schwartz et. al., 2005, 2). An attitude of having to "prove that" is not predominantly fundamental for this research, rather one of "exploring and testing what."

On the one hand, design research strives to achieve concepts or theories that will be useful for current practices. On the other hand, theories are pursued that transcend a learning situation's application area.

For example, a project's result could be practically proven teaching concepts, which, in addition to a concrete product, offer the practitioner design principles whose basis could generate suitable concepts for similar situations. While these principles provide fundamental orientation, they do not exonerate practitioners from the task and responsibility to transfer these concepts to new application conditions.

Experienced practitioners are included in the different phases of the research and developmental process, thereby opening up other approaches to research fields of practice, as this is allowed in the context of "distant research." The expectations are that solutions' quality will increase and the transfer of collectively developed (and thus practicable) theories will be improved in practice. For example, experienced practitioners normally have an extensive know-how and a strong intuition regarding where the critical events in a developed teaching concept's application are to be found. Including experienced practitioners can make this often implicit knowledge useful for the development phase and can shorten the route to a high-quality intervention. Thus, cooperation of researchers and practitioners is one of the key characteristics of design-based research.

2.0 Cooperation of Researchers and Practitioners on Different Levels of the Research Process

The Special Issue is entitled "Challenging Design-Based Research" and therefore contains at least two different interpretations. "Challenging Design-Based Research" describes DBR as a type of research that is not easy to be done. It implies that *the researcher* is challenged by DBR. Looking at the many different approaches and projects in this issue that differ in their questions, the methods used, and their aims, but at the same time are all assembled under the label DBR, imply that DBR does not appear naturally as the only approach. Already in 2014, Euler and Sloane pointed out that DBR is to be considered as a „paradigm under construction" (Euler & Sloane 2014, 8) that integrates various approaches without trying to unify them, but to value their uniqueness. Now in 2020, the question arises to what extent DBR as the „paradigm under construction" (ibid.) has developed and whether there is the possibility to systematize today's DBR projects.

Keeping this question in mind, the above-mentioned second title interpretation is meant to create attention. "Challenging DBR!" is a call asking the research community to work on what DBR could be, and to question and develop the paradigm. It is to be understood as a plea for getting into contact for the sake of DBR, for overcoming the differences marking DBR projects not in order to harmonize them, but to understand the uniqueness of each and every DBR project as a possibility for mutual learning among the research community. It means that no researcher can lean back on his or her DBR project being satisfied with what has been achieved. It means that the research commu-

nity depends on the involvement of each and every member. This supports the idea that DBR is not at all a single-person project, but that it relies on the communication and cooperation not only between the different people, organizations, and institutions that are often involved in DBR, but also among the research community itself. The researcher is not only challenged by DBR – it is *DBR* itself that is and needs to be challenged by the researcher and the community. Involvement into a research community is nothing that can be taken for granted. It not only means to be in contact with those who have already been members of a community for many years. It also means to welcome, introduce and induct those who might be seen as early-stage researchers. In order to get a grip on the openness of DBR, every researcher, inasmuch as he or she wants to get involved and is ready to take responsibility for his or her position, is a precious member for the community to further develop our understanding of DBR.

As diverse as the research projects, programs, and attitudes that come together under the heading of "Design-Based Research" are, they are united in addressing learning and the design of learning environments as core moments of research. Here, it is implicitly assumed that research and learning are structurally identical: Just as the practitioners learn to restructure their habits, strategies, methods of action, etc. in order to solve their problems, the researchers get to know the practitioners' world, design systematizations of this world and thereby expand their own knowledge repertoire. On the one hand, the idea here is that researchers do not approach practice with ready-made solutions, but that researchers and practitioners cooperate in order to develop prototypes which support the practitioners to pursue innovative objectives in their field of work. On the other hand, the researcher develops insights into a field of work which he or she would not have achieved otherwise and thus gets the chance to develop knowledge about this specific field (Sloane 2014). What is important here is that the generation of knowledge does not ask for a distanced attitude from the researcher towards the practitioner, but is based on the researcher's experience of the research field which, at the same time, is the practitioner's context of work. It is assumed that a group of people bound together in specific working contexts develop their own cultural-linguistic, organizational and technical strategies, practices and behaviours, each of which has its own distinctive features. In other words: None of the learning locations that often frame research access in vocational and business education research, be they companies, schools, universities and the associated learning contexts, are alike, although they are comparable. Thus, the methods, techniques, and so on that are developed to deal with problems arising in everyday-life at a location A can be completely different compared to those which are implemented at a location B where the practitioners are involved in a totally different working context and therefore might have different needs than the practitioners in location A. Here, the researcher is required to familiarize himself or herself with the particular conditions

on site: The researcher needs to “get into” the real-life context the prototype is developed for (Sloane 2006, 624).

In dealing with what may seem different and strange, a potential becomes obvious that needs to be addressed. This may sound trivial: However, if it is taken into account that the objects of study and research in DBR are usually of an implicit and reciprocal nature, this notion is not straightforward. For example, the design of cooperation and communication between researchers and practitioners, as addressed in this Special Issue in various articles, is not only a pre-condition for the successful development of prototypes, but is often also the practitioner’s purpose of action, for example, when it comes to the formulation of intercultural teaching skills. "Cooperation" can be relevant in two ways, on the one hand with regard to the process of prototype development, and on the other hand as an object of learning and action for teachers who deal with design issues of communication and cooperation in the classroom in the context of intercultural learning and teaching. In this example, "communication" and "cooperation" are both subject and object: the object as the teaching and learning object and the subject as part of the structure of one's own research activity, which is reflected in the design of cooperation and communication between researchers and practitioners. From a researcher’s point of view, it can be stated that what is being reflected on as an object also becomes part of the researcher’s own (research) behaviour.

From this short outline two challenges become obvious that have to be faced by the researcher who adopts DBR as a research approach. The first challenge is that the researcher has to deal with the implicitness of his research object which, above all, evolves from the conjoint activities of researchers and practitioners (see also: Sloane 2017, 362) and at the same time also addresses the possibilities and limits of the researcher’s own capabilities of action. The second challenge arises from the uniqueness of the learning and research environment and its potential to offer a space for generating knowledge.

3.0 Research Activities in DBR: What are the Contributions in this Special Issue about?

The Special Issue addresses different perspectives on what is commonly described as DBR and shows that the above-mentioned challenges, especially referring to cooperation, are important and have to be considered in specific forms. At a high level of abstraction, very basic research questions about DBR that concern the research attitude can be asked. *Tina Emmler* offers in her article *“Die (Innovations-, Forschungs- und Entwicklungs-)Arena in der gestaltungsorientierten Forschung: The Empty Space”* a description about the so-called “arena“ which in earlier articles of Sloane (2007) and Kremer (2014) is understood as a space where the cooperation between researchers and practitioners in DBR takes place. Relying on the concept of the *“*Empty Space“ which she adapts from an aesthetic education background for

DBR, she conceptualizes the "arena" as a space of and for thinking, which helps her to handle the experiences she gains in cooperation processes with the different practitioners in DBR. She also focuses on the question what it means to be confronted with what she experiences as different to her personal attitudes and meanings and verbalizes the difficulty of discovering and accepting other ways of life which, of course, in today's world should be taken as given, but nonetheless is a challenge in the concrete development of prototypes. Thus, the "Empty Space" cannot be taken for granted: It requires the researcher to apply a specific attitude. From an empirical-phenomenological perspective the article can be understood as an attempt to describe a certain process of reflection (Sloane 2014, 122), the "Epoché", as it is illustrated by Schütz and Luckmann (1979, 53) with reference to Edmund Husserl.

While Emmler's contribution focuses on the researcher's thinking about the practitioner's world, *Janika Grunau* and *Bernd Gössling* describe the cooperation between researchers and practitioners in their article *"Cooperation between research and practice for the development of innovations in an educational design project"*. In doing so, Grunau and Gössling focus on forms of cooperative management processes using the example of a DBR project, which is essentially about the adaptation of the European validation model for the recognition of informally acquired skills in the field of geriatric care in Germany. On the basis of Euler (2014) they are interested in 'the creation of conditions for an open, constructive and trusting cooperative relationship' (Grunau & Gössling, this issue), always taking mutual learning processes between researchers and practitioners into account. The aims, skills and behaviour of cooperation in DBR and their contribution to innovation as well as restrictions are presented and discussed.

While Grunau and Gössling focus on the direct cooperation between actors in research and practice, *Tina Emmler* and *Petra Frehe-Halliwell* assume an indirect cooperation, i.e. they conceptualize relationships as mediated in their contribution *"The Epistemological Relevance of Case Studies as Narratives in Design-Based Research"*. Thus, the question arises what serves as a medium in DBR, how this medium contributes to a mutual understanding and if it possibly has potential in the process of generating knowledge. Emmler and Frehe-Halliwell contend that case studies which are regularly developed in DBR as a by-product of research, could serve as such a medium. The basic assumption here is that researchers and practitioners, even if sharing the same nationality, come from different environments, and therefore approach DBR with different linguistic and cultural behaviours. If a cooperative learning process is to take place, then it is necessary that the language of the respective counterpart including the interpretation of behaviours needs to be learned. According to *Emmler* and *Frehe-Halliwell*, case studies represent an opportunity to ascertain the researcher's experiences with practitioners and are also the starting point for interpretations of what has been experienced. In short, case studies are under-

stood as narratives about what researchers experience in the practitioner's environment. Based on Walter Benjamin's remarks on the meaning of translations, the case studies are re-formulated as the creation of a narrative original and a related translation, from which the potential for generating knowledge arises. Thus, Emmler and Frehe-Halliwell newly interpret the relevance of case studies: They are no longer seen as by-products of research, but as a central element in the process of knowledge making. In a second contribution entitled "*Case Studies and their Epistemological Potential in Design-Based Research – A Practice Illustration" Frehe-Halliwell* and *Emmler* also offer an insight into the practical work with case studies which also allows a schematic positioning of case studies in the context of a concrete DBR programme.

In her contribution *"Entwicklung von Gestaltungsprinzipien zur Förderung interkultureller Lehr-kompetenz", Michèle Collenberg* presents the research activities in DBR in the form of case studies or excerpts from them. Here, Collenberg traces the emergence of design principles for the development of an innovative learning environment, taking into account the ethnic and cultural heterogeneity of learners in the upper secondary level of vocational education in Switzerland, focusing above all on a product perspective. In the reflection of the evaluation process, in which Collenberg leads from the original preliminary design assumptions to the design principles as a result of the research, the interplay between product and process perspectives becomes particularly clear. The description of the evaluation process also takes up an open desideratum of DBR, according to which the methods of data collection and evaluation are by no means given per se, but are still to be discussed in the research community.

In their contribution "*Dual Study Programmes as a Design Challenge: Identifying Areas for Improvement as a Starting Point for Interventions"*, *Lisa Mordhorst* and *Bernd Gössling* illustrate the challenges researchers face on different levels of action when implementing training-integrated dual study programmes through DBR: "Based on a literature review, this paper classifies and explains the design challenges at the level of the learning environment, the study programme and the organisation" (Mordhorst & Gössling, this issue). As a result, they conclude that the cooperation and integration of Higher Education and Vocational Education Training (VET) plays a major role and, at the same time, constitutes a relevant objective for DBR.

Karl-Heinz Gerholz, Sebastian Ciolek and *Anne Christina Wagner* illustrate how cooperation and communication between researchers and practitioners in DBR can be managed on the ground, using different digital devices. In their contribution: *"Digitalisation of Design Research – A case study to illustrate the use of digital technologies and tools for collaboration in Design Research projects",* they refer to digital tools and how they can support the design, implementation, and evaluation of the development of prototypes in DBR. The authors pay particular

attention to the design phase of their DBR project that aims at implementing tablet computers in vocational schools. In order to get involved with the teachers as well as to offer them the possibility to get to know or to deepen their knowledge about digital devices, a digital consultation session, an online hotline, and a webinar are implemented by the researchers. The evaluation of these tools is presented as well as a reflection on the evaluation which is also conducted via digital media. As central elements of a successful usage the authors present a (1) "blended co-operation" between teachers and researchers which means that digital communication is mixed with face-to-face communication, (2) the possibility of screen-sharing in digital structured meetings, and (3) the compatibility of technology used by people involved in processes of communication and cooperation.

The Special Issue "Challenging Design-Based Research" demonstrates that different questions on paradigmatic, methodological, and methodical levels referring to cooperation between researchers and practitioners can and have to be addressed in DBR. At the same time, it becomes clear that mutual learning processes are not trivial and ask the researchers to get creative when it comes down to getting to know the practitioner's world. It is precisely the turn to and examination of the specific contexts in which DBR projects are located that not only leads to a situated knowledge, but also initiates knowledge generating processes that go beyond these specific contexts. Furthermore, insights into DBR projects indicate that the design of cooperation and communication between the various levels of action as well as between the people involved in DBR is far from complete. Thus, we hope that this Special Issue serves as a stimulus and inspiration for thinking about and for designing DBR projects.

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Author Profile

Tina Emmler is a postdoctoral research fellow and lecturer at the Department for Business and Human Resource Education at the University of Paderborn, Germany. Her research is characterized as empirical-phenomenological and focuses on designing innovations and its connection to knowledge management in the context of vocational education and training. Since she conceptualizes knowledge building processes as highly divergent and creative, Dr. Tina Emmler also conducts transdisciplinary research in which she examines the meaning of aesthetical theory for the understanding of knowledge building. Here, she draws on her expertise as actress, stage director, and coach in the field of cross-theatrical learning and teaching.

Dieter Euler hold the Chair for Educational Management at the University of St. Gallen / Switzerland from 2000-2018. Before that, he was Professor for Business Education at the University of Potsdam (1994-1995) and Nuremberg (1995-2000). He studied Management, Business Education and Social Philosophy at Cologne University and the London School of Economics and PoliticalScience (LSE). Prof. Euler holds several mandates in international scientific bodies and is involved in various innovation projects in the area of Quality Development, Higher Education Development and Vocational Education and Training. His research interests focus on innovative ways of teaching and learning, strategical aspects of educational management (including quality development at Higher Education), vocational education and training and corporate learning.

Hubert Ertl has been Research Director and Permanent Representative of the President at the Federal Institute for Vocational Education and Training (BIBB) since 1th September 2017. After training as a management assistant in wholesale and foreign trade in 1988 and two years of employment in this profession, he completed his vocational baccalaureate in 1992 and then received his diploma in business education at the Ludwig-Maximilian University of Munich in 1997. He completed an ERASMUS exchange program at the University of Birmingham in 1995/1996. Between 1997 and 98 he completed an MSc Program in Comparative and International Education at the University of Oxford, which he concluded with a dissertation on "Modularisation of Vocational Education in Europe: NVQs and GNVQs as a Model for the Reform of Initial Training Provision in Germany? After academic activities at the universities of Munich, Paderborn and Oxford, Prof. Ertl worked as Associate Professor of Higher Education in the Department of Education at the University of Oxford until his appointment to BIBB. Since 2010 he is also Senior Research Fellow of SKOPE (Centre on Skills, Knowledge and Organisational Performance, University of Oxford). In 2013, as part of this role, he was Head of Exam Board Postgraduate Diploma in Learning and Teaching in Higher Education, and from 2016, Director of MSc Education.

Author Details

Dr. Tina Emmler

Wirtschafts- und Sozialpädagogik
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-3292
Tina.Emmler@uni-paderborn.de

Prof. Dr. Dieter Euler
Institute of Business Education and Educational Management
University of St.Gallen
Dufourstrasse 40a
CH-9000 St.Gallen
Switzerland
+41 71 224 2630
Dieter.Euler@unisg.ch
iwp.unisg.ch

Prof. Dr. Hubert Ertl
Professur für Berufsbildungsforschung
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-2365
hubert.ertl@uni-paderborn.de

Forschungsdirektor am Bundesinstitut für Berufsbildung (BiBB)
Robert-Schuman-Platz 3
53142 Bonn
Germany

Editor Details

Prof. Dr. Tobias Jenert
Chair of Higher education and Educational Development
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-2372
Tobias.Jenert@upb.de

Journal Details

EDeR – Educational Design Research
An International Journal for Design-Based Research in Education
ISSN: 2511-0667
uhh.de/EDeR
#EDeRJournal (our hashtag on social media services)

Published by

Hamburg Center for University Teaching and Learning (HUL)
University of Hamburg
Schlüterstraße 51
20146 Hamburg
Germany
+49 40 42838-9640
+49 40 42838-9650 (fax)
EDeR.HUL@uni-hamburg.de
hul.uni-hamburg.de

In collaboration with

Hamburg University Press
Verlag der Staats- und Universitätsbibliothek Hamburg – Landesbetrieb
Von-Melle-Park 3
20146 Hamburg
Germany
+49 40 42838 7146
info.hup@sub.uni-hamburg.de
hup.sub.uni-hamburg.de