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How to align objectives of practitioners and scientists in DBR projects?

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Abstract The interaction of scientists and practitioners is an essential component within Design-Based Research. Their close collaboration is assumed to hold the potential to increase the quality of both the innovative solution of educational problems and the generation of scientific knowledge. At the same time, there are some challenges associated with realizing this potential. This paper explores the opportunities and challenges of collaboration between researchers and practitioners in DBR projects. After a broader description of the problem situation, an in-depth discussion of the interests, perspectives, and frame conditions of the project actors from science and practice takes place using the example of the determination of project goals. The paper ends with the recommendation of design principles for the cooperation of scientists and practitioners.

Keywords Science-practitioner collaboration, DBR process, Role of practitioners in DBR, Negotiation of DBR project objectives

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How to align objectives of practitioners and scientists in DBR projects?

Dieter Euler

1.0 Starting points

In Design-Based Research (DBR), practitioners play a different role than they do in many other research approaches. One may even state that the specific interaction of practitioners in cooperation with scientists justifies calling it a key characteristic of DBR. Their relationship during the research process is termed in different ways. Euler (1994) coins it “science-practice-cooperation” while Hemkes et al. (2017) use the term “innovation partnership”. Against this backdrop, it is remarkable that the relationship between practitioners and scientists has been addressed only implicitly in many DBR texts. In particular, this applies to the two seminal textbooks of Susan McKenney & Tom Reeves (2012) and Arthur Bakker (2019). “Practice” and “practitioners” are mentioned in some paragraphs, but there is no elaboration and reflection on the different roles practitioners may play in DBR projects or how the relationship between practitioners and scientists can be designed. The following quotation proves the importance of collaborating with practitioners without elaborating on how this should be conducted: “Educational design research is conducted – to varying degrees – in collaboration with, not solely *for* or *on* practice. It requires collaboration among a range of actors connected to the problem at hand. Starting with identification and exploration of a problem together with the problem owners …, the craft wisdom and ground-level instincts of research partners in schools and other design research contexts are valued, studied, and put to use. Researchers learn from practitioners, e. g. through adaptations of interventions that meet the same basic goals in ways different from those conceived of by its designers …, and vice versa” (McKenney & Reeves, 2012, 14).

The lack of elaboration in respective literature triggered the motivation to reflect deeper on the relationship of practitioners and scientists in DBR. The following ideas are primarily based on experiences from the author’s research practice and from supervising PhD students in conducting their research project. Thus, this paper is largely of an explorative nature and designed to stimulate methodological reflection on this dimension of DBR.

The line of reasoning is structured in four steps:

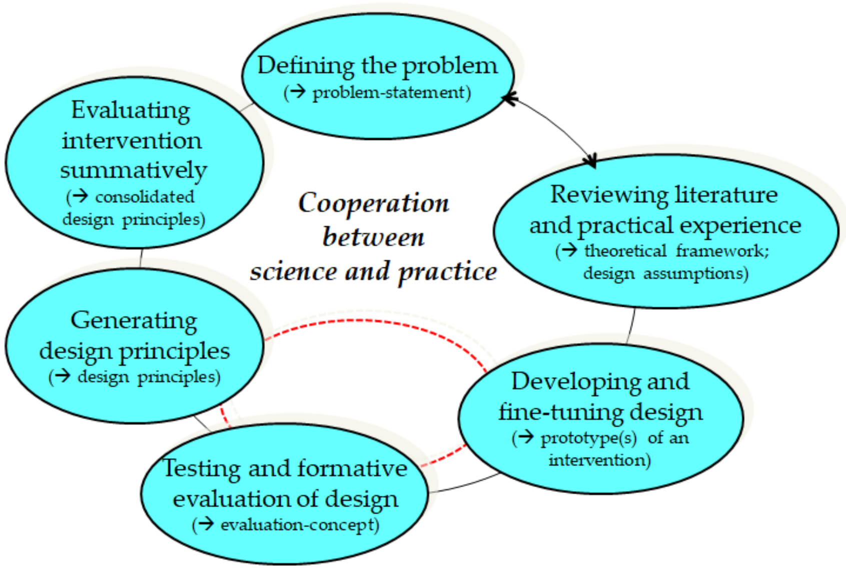
1. Context: How can practitioners contribute in different phases of the DBR process?
2. Relevance: Why is the alignment of objectives between practitioners and scientists important in DBR?

3. Challenges: What can make the cooperation between practitioners and scientists in DBR difficult?
4. Suggestions: Which principles can guide the cooperation between practitioners and scientists?

2.0 Context: How can practitioners contribute in different phases of the DBR process?

The research and development process of DBR can be structured into several phases, each of which requires an agreement between practitioners and scientists on their respective roles and formats of cooperation. Although the numerous process models by various authors (see McKenney & Reeves, 2012, 73; Reinking & Bradley, 2008, 67 ff.) differ in their number of phases and notional descriptions, their basic structures display a high degree of similarity. The following figure outlines the basic structure of a DBR process model introduced by Euler (2014, 20).

Figure 1: DBR process model (Euler, 2014, 20)



Defining the relationship between science and practice in terms of mutual interaction is a key element of the approach. DBR represents a type of research which Sloane (2006) terms "responsive research", different to "distanced research" or "intervening research". All three types follow a specific understanding of the relationship between science and practice. In "distanced research", practice is the object of research and, in this context, both empirical-analytical approaches and those from the humanities come into play. In the first instance, practitioners are interviewed and observed; in the second, they are the object of distanced reflection; in certain circumstances, they may also be included to validate the findings. In "intervening research", the practice is subject to change and improvement by researchers, while practitioners tend to retain an object role. The discourse and the implementation of actions are key components of the method. The boundary between science and practice becomes blurred in the actions.

While distanced research seeks to improve theories, intervening research pursues the improvement of practice. “Responsive research” leads to a continued exchange between science and practice whereby the practice remains accountable for its actions and decisions.

In DBR, the cooperation between science and practice is not a purpose in itself, but a means to increase the scientific and practical relevance of the interventions and/or theories. Including experienced practitioners in the various phases of the DBR process should enable access to the particular field of practice’s experience and perspectives, which will improve the quality of solutions and theories, and, thus, increase the probability that these “practicable” theories will be applied in practice. These design principles, obtained in cooperation with practitioners, are not only the result of scientific knowledge acquisition, but are also available to practitioners in order to work on and solve similar practical problems (Sloane 2013, 20).

Depending on the phase, the cooperation can take on various forms and intensities, the practice response can range from commenting on scientific proposals to the testing of the agreed concepts and the adoption of individual process stages (see Wagner 1997, 17). Based on the author’s project experiences, practitioners can potentially take on the following tasks:

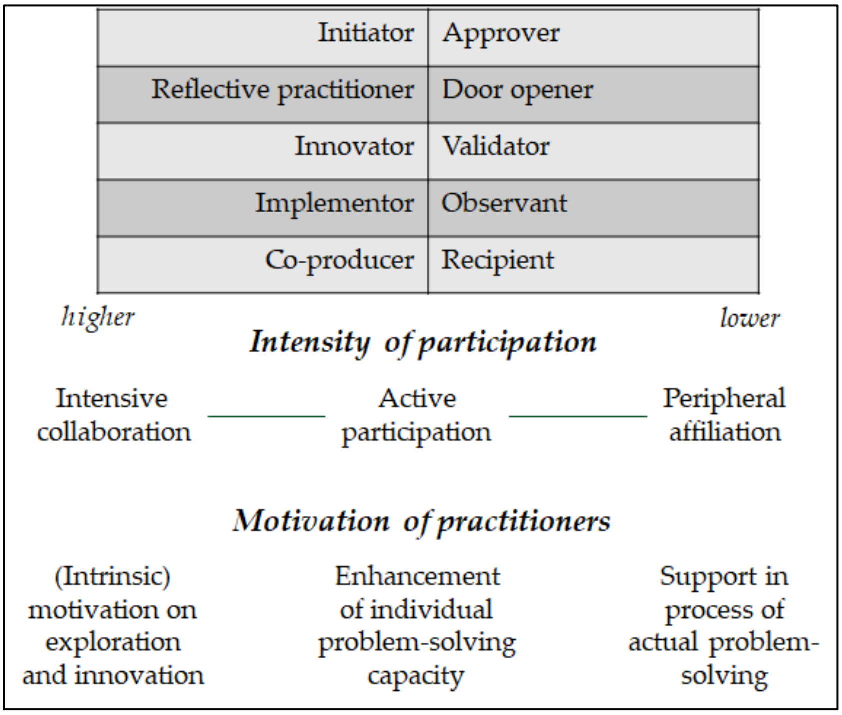
Defining the problem	• Articulate and justify the relevance of specific challenges in practice. • Contribute to defining an examinable problem. • Activate available experience knowledge with regard to the framework conditions and options for a potential problem solution. • Align the objectives and expectations of a design research project.
Reviewing literature and practical experiences	• Contribute to field observations and gathering of contextual knowledge. • Validate initial suggestions about potential approaches to the development of solutions.
Developing and fine-tuning design	• Suggest practical approaches based on experiences gained in similar areas. • Point out different conditions of application in the field of practice. • Point out possible excessive demands in the implementation of design concepts. • Contribute and/or validate initial proposals for an intervention.
Testing and formative evaluation of design	• Contribute to testing of the intervention. • Reflect on and document the testing experience. • Contribute to the development of alternatives to further improve the intervention.
Generating design principles	• Validate the proposed design principles.

	• Provide feedback on the application range and the limitations of the respective principles.
Summative evaluation of design	• Organize access to a wider field of practice. • Contribute to the validation of evaluation results.

Table 1: Potential tasks and activities of practitioners in the DBR process

As regards the practitioner's contribution in the scientific part of a DBR project, Dimai et al. (2017, 4) introduce a continuum ranging from intensive collaboration up to peripheral affiliation (see also Kremer 2014). The following figure covers the various roles and motives practitioners can take in DBR projects.

Figure 2: Continuum of roles and corresponding motives of practitioners in DBR projects (Dilger & Euler, 2018, 14).



Despite the more or less extensive contributions practitioners can provide in the DBR-process, stakeholders from science and practice pursue different goals and interests in cooperation with each other (see Euler, 1994, 239). Their interests differ in that:

- Although there are researchers who are interested in practitioners' working theories representing specific contextual knowledge of expert practitioners, science is *primarily* interested in collecting and examining viable theories of a larger scope, whereas innovating a field of practice is secondary;
- practice is primarily interested in developing solutions for problems considered relevant and urgent, and developing and formulating suitable solutions for specific practical problems are secondary.

Against the background of their differing interests, communication between science and practice can only succeed if practice is open to scientific theories‘ different perspectives and, vice versa, if science can accept practice’s experience, merge these with their own, and communicate them. This approach rejects the assumption that the experts (in science and/or practice) can only exchange knowledge between themselves. Science is, therefore, not only an instrument of criticism, description, or explanation of practice, but also one of design in terms of the discovery, development and testing of concrete solutions in and with practice.

While cooperation between practitioners and scientists in DBR projects face different challenges in different phases of the DBR process, the investigation in the following chapters will focus on the first phase (“defining the problem”). At the very start, practitioners and scientists have to define the problem to solve. At that point, the different perspectives come into play and need clarification. Ideal result is the definition and elaboration of a problem statement covering the perspectives of both sides.

3.0 Relevance: Why is the alignment of objectives between practitioners and scientists important in DBR?

DBR is supposed to correspondingly serve the demand of practitioners and scientists. In designing, developing, and evaluating educational interventions (e. g. programs, teaching-learning strategies and materials), DBR aims at achieving solutions for complex problems in educational practice and advancing knowledge about the characteristics of these interventions and the processes of designing and developing them (Plomp, 2007, 13). DBR follows the assumption that cooperation between practitioners and scientists creates specific potential for achieving outstanding solutions for practical problems and at the same time gain notable research insights. “What sets educational design research apart from other forms of scientific inquiry is its commitment to developing theoretical insights and practical solutions simultaneously …” (McKenney & Reeves, 2012, 9). Both sides follow the idea of entering a positive-sum game: Scientists can link investigation with real-life problems, practitioners can achieve solutions for their problems based on scientific knowledge. Both lead to valid theories and well-reasoned problem solutions.

The common denominator for entering into a DBR project is to jointly work on a problem relevant in practice and with some potential for scientific inquiry. In many projects, at first sight practitioners and scientists seem to work on the same problem. However, due to their different interests and roles they often approach a seemingly common problem from different angles and in fact pursue different goals. The following example based on a DBR project (Raatz, 2015) is going to illustrate the different approaches in dealing with a specific problem / research question.

The project is to intervene into an executive education program at a Swiss university. The program is split into ten modules each facilitated by a faculty member of the university. A module lasts two weeks and has around 40 participants which are occasionally split into subgroups. Most modules deal with problems related to functional business areas (e. g. financial, strategic, human resources management), primarily addressing factual topics and teaching expert knowledge. Within this well-established setting, the DBR project introduced the idea to enrich the program with interventions in three modules aimed at making the participants reflect on ethical dimensions of leadership behavior. Along with the facilitators of these modules, a PhD student was engaged in designing and developing adequate interventions based on a defined *problem statement*: How can future business leaders gain the competences to reflect on ethical dimensions of leadership behavior in their expert domain?

While the module facilitators (taking the role of educational practitioners) were basically interested to enhance their courses with a modern topic requiring new teaching and learning approaches, the PhD student entered the project with the ambition to gain insights on the implementation of a newly developed educational intervention which can be generalized and transferred into similar educational environments.

The following table illustrates the point of departure when starting the DBR project:

Initial problem statement: *How can future business leaders gain the competences to reflect on ethical dimensions of leadership behavior in their expert domain?*		
	Practitioners	***Scientist***
Learning goal(s) for program participants	Create awareness and interest on reflecting on values in own business environments.	Reflect deeply on ethical values and their impact on own and others' behavior
Scope of intervention	Design and apply one viable and robust intervention. Identify what works well.	Design and test broad variation of promising types of interventions. Investigate enabling / hampering factors of respective interventions.
Key results	Develop 'actionable knowledge and skills' to be embedded in existing teaching practices.	Generate 'generalizable knowledge' on what works and what does not.

Table 2: Perspectives of practitioners and scientist when starting a DBR project

Practitioners and scientists meet because of their (at first often broad) interest on a seemingly common concern: to find an answer to a broadly defined problem. Objectives and background assumptions are not transparent. “Rather, as soon as researchers co-design with teachers or other stakeholders in education … then goals become negotiable targets. They are shaped in the process of working together“ (Bakker, 2019, 16 f.). At best, different notions of the initial problem statement become transparent, can be discussed, and finally clarified or settled. At worse, they remain hidden and put a strain on the interaction which then results in disappointing cooperation processes. As a consequence, investing some efforts on the alignment of the objectives between practitioners and scientists can become an important step towards an effective cooperation in the project.

4.0 Challenges: What can make the cooperation between practitioners and scientists in DBR difficult?

What are the challenges to align different perspectives of practitioners and scientists on the initial problem statement? An answer would require some discussion, negotiation and clarification at the beginning of the DBR project to reach transparency on the underlying motives and interests and to achieve a common understanding. For this discussion to start, it is useful to be aware on the potential differences between practitioners and scientists embarking on the DBR project. The case example already introduced some insights which can now be elaborated and structured.

Type of targeted knowledge different

It has already been pointed out that the type of knowledge the two parties strive for is different. Practitioners want to know how to solve the problem for the specific environment they are operating in (“actionable knowledge”). Scientists can pursue different epistemological interests. For example, they have an interest in understanding a problem solution more precisely. Or they want to know how to solve the problem in this and in a cluster of similar environments – the scope of interventions being as broad as possible (“generalizable knowledge”). Against this backdrop, the facilitators of the courses would be happy to arrive at an individual teaching plan covering the main steps for them to achieve the goal(s). Scientists won’t only like to address the intervention in one course, but also compare different ways analyzed in different courses or with different target groups to compare experiences and extract commonalities and differences to draft design principles or conjecture maps.

Cognitive style in dealing with problems different

While practitioners use to explore pragmatic and hands-on ways for solving the problem, scientists also follow an experimental and evaluative approach to find out what works for what reason and what does not. While practitioners often tend to deal with criticism and doubt up to a certain point in the problem-solving process, scientists regard these attributes very important to gain relevant knowledge. Course facilitators in the case example might preferably want to follow a teaching plan with major steps without deeper explanations on underlying reasoning. In contrast, scientists are interested to figure out the conditions and reasons which make interventions succeed or fail.

Another facet of this challenge can occur if practitioners take existing frame conditions for granted while scientists suggest to also think out of the box and discuss alternatives which might challenge some of the frame conditions. For example, the program is split into modules each of which deals with specific expert domains (e. g. strategic, financial, HR management). Alternatively, dealing with ethical reflection could also be highlighted in a separate module addressing the topic in a cross-sectional way.

Readiness for time investment different

Investment of time for the development of new learning environments and duration to test them in real course settings often differs between practitioners and scientists. For practitioners, the time spent for the development of innovative teaching and learning approaches usually conflicts with other responsibilities and therefore is limited. Regarding the time available for dealing with ethical issues, they need to trade it off against dealing with technical knowledge of the expert domain. Thus, practitioners may be satisfied with the first best solution while scientists are keen on working for more extensive and robust solutions which can be applied flexibly under different circumstances.

Power to decide on implementation different

Testing of innovative approaches requires access to practice. Although the testing of new educational designs is not necessarily conducted by practitioners, they have the power to regulate access to the field of action in practice. Thus, any implementation of designed interventions requires convincing practitioners to get their approval. In that sense, practitioners are not only partners, but they are powerful gatekeepers defining the limitations of implementation. In the case example, facilitators occasionally expressed some concern that some of the ideas put forward by the scientists would be too demanding for the course participants and thus should not be applied. Moreover, if facilitators were to implement new teaching approaches themselves, they sometimes made clear that specific parts of the interventions go beyond their teaching expertise.

Pressure to act may be different

Practitioners may also feel specific expectations, skepticism, restraint or even reluctance in their environment with regard to the DBR project. This could support or jeopardize their engagement in the project. For example, in executive education the community is split into those who regard ethical issues as outside the core domain of management education while others see it as an essential topic.

“Practice” as a multi-dimensional reality

One additional challenge may be due to the fact that “practice” in DBR projects often needs to be conceptualized and addressed in plural. In the case example, practitioners are manifold, e. g. course facilitators, students, program managers. Even more complicated: within each of these groups, perspectives, readiness to participate, attitudes and normative viewpoints can be different. This raises the question about whom to involve in the DBR project. Only those who are open-minded and highly engaged in solving the problem? Or also those who are skeptical in the first place, but may add challenging perspectives? One could argue that without the latter group results worked out in the project would be of limited value.

All the differences may make life in DBR projects demanding and challenging. At the same time, they provide a chance to capture the diversity and plurality of practice and test newly developed designs in real-life settings.

5.0 Suggestions: Which principles can guide the cooperation between practitioners and scientists?

Multiplicity of perspectives holds great potential for achieving outstanding results. At the same time, exhausting the potential requires some efforts in dealing with mutual expectations, different assumptions and sometimes conflicting interests of involved practitioners and scientists. Given the relevance but also the challenges of reaching an alignment regarding the objectives of the DBR project, there is a need for discussion, clarification and probably negotiation right at the beginning of a DBR project. This process should ideally result in a kind of agreement which can be the basis for a continuous monitoring in the course of the project.

This clarification process is based on technical and attitudinal dimensions. As part of the *technical dimension* a series of guiding question can be addressed. Among others:

- Interpretation and mutual understanding of the initial problem:
  How is the problem perceived from the various perspectives?
  What are the expectations to meet and objectives to achieve on both sides?
  What should ideally have happened for either side at the end of the project?
  What output and outcomes expect practitioners to gain (e. g. teaching plan, enthusiastic students)?
  What design principles on what issues do scientists strive for (e. g. motivation and engagement of students; deepness of reflection processes; resistance of students; variation of teaching activities)?

- Detailing the initial problem:
  What are relevant sub-questions for the practitioners and scientists (e. g. with regard to: learning goals for students; learning-conducive teaching strategies / activities; effects / learning outcomes of the implementation strategy)?
  Which sub-questions meet common interests of practitioners and scientists, which are of particular interest just for one side?

- Appraisal of sub-questions (see also: Bakker, 2019, 77):
  Do questions address a knowledge or research gap?
  Are questions pragmatically and theoretically relevant (why put so much effort and resources into research)?
  Are main concepts precise and anchored in the literature (how to build on existing work)?
  Are concepts manageable within a reasonable time frame and with available resources?

Apart from the technical dimension, the *attitudinal dimension* may heavily influence the cooperation between practitioners and scientists. This part of the relationship is less one of clarification or even negotiation, but one of mindfulness and alertness, acknowledgement of equity and common interests. Among others, principles as the following may contribute to the success of the project:

- Openness towards the interests, mindset, constraints, etc. of the other.

- Constructiveness in terms of designing approaches that may work.

- Trust in good intentions and engagement of the other (either this has already been built up beforehand, or it might take time to develop).

- Using non-technical language or at least making an effort to understand each other's perspectives and develop a common language in dialogue.

A prerequisite for dealing with potential challenges is knowing and accepting their existence. This is highly important at the beginning of the DBR project, but can also be incorporated into the project on a regular basis. Thus, occasional or regular events to reflect on the mutual objectives, expectations and achieved or missed goals may keep the project straight on course or evoke corrections if necessary.

One final principle seems to be self-evident, but is nevertheless important to consider: Who is going to launch and monitor the process of clarification and alignment of the objectives? Given the diversity of stakeholders on the practitioner's side, finding an answer may be both important and difficult. As so often when addressing research issues, one starts with questions and ends with even more! Here I finish without ending …

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