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Quality and impact of practice-oriented educational research

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1. INTRODUCTION

1.1. Practice-oriented educational research

Educational research has historically been aimed at creating scientific understanding of education. Under the influence of changing societal values and consequent questioning of research primarily focussed on scientific understanding, researchers started to expand their focus to issues and approaches that had a more direct value to society (Atkin, 1993). This led to the emergence and establishment of more practice-oriented educational research alongside the prevailing theory-oriented educational research. For example, in the 1980s action research (Atweh, Kemmis & Weeks, 1998), in the 1990s design experiments (Collins, 1992; Brown, 1993) and in the 2000s lesson study (Fernandez & Yoshida, 2004) emerged as research approaches that primarily focussed on impact in educational practice and were conducted in real educational settings with substantive involvement of teachers. As these practice-oriented educational research approaches evolved, their primary focus expanded and became twofold: to contribute to both educational practice and to educational research. This expanding focus is evident from increasing scientific publications on action research (e.g., the establishment of scientific action research journals), the shift of design experiments to design-based or educational design research (e.g. The DBR Collective, 2003; van den Akker, Gravemeijer, McKenney, & Nieveen, 2006; McKenney & Reeves, 2012; Bakker, 2018) with as an explicit characteristic a simultaneous focus on utility and theory development (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006), and the increasing use of lesson study for research purposes (Bakker, 2018).

Practice-oriented educational research received mixed receptions. Some welcomed it as a mode of research that could increase the impact of educational research in educational practice and remedy the perceived gap between educational research and practice that resulted from the detachment of traditional research from practice. Others critiqued its quality on the basis of the use of research methods that differed from traditionally used methods (Lagemann & Shulman, 1999). The popularity of practice-oriented educational research among educational researchers increased, nonetheless. However, this increasing popularity was accompanied by continuous questioning of its quality (e.g., Atkin, 1993; Fenstermacher, 1994; Huberman, 1996; Shavelson, Philips, Towne, & Feuer, 2003; Carr, 2007), mainly due to the fact that practice-oriented educational

research does not necessarily conform to traditional understandings of quality because of its dual aim and corresponding alternative research methods.

Doubts also emerged about its impact (e.g., Cordingley, 2008; Cooper, Levin & Campbell, 2009; Gardner, 2011; Dagenais, Lysenko, Abrami, Bernard, Ramde, & Janosz, 2012). Although expectations of the impact of practice-oriented educational research were high, due to its characteristics and twofold aim to contribute to the advancement of both educational practice and research, the achieved impact was generally perceived as being low. Following from its twofold aim, practice-oriented educational research was also perceived to have the potential to enhance the connection between educational research and practice (Zeichner, 1995; Broekkamp & van Hout-Wolters, 2007; Vanderlinde & van Braak, 2010; Jochems, 2012; Voogt, McKenney, Pareja Roblin, Ormel, & Pieters, 2012; Snow, 2015). However, so far this potential seems to not have been fulfilled to a satisfactory extent (e.g., Burkhardt & Schoenfeld, 2003; Gore & Gitlin, 2004; Brown, 2005; Miretzky, 2007; Schoonmaker, 2007).

Farley-Ripple, May, Karpyn, Tilley and McDonough (2018) argue that connecting educational research and practice is a bidirectional issue that should be understood and addressed in both directions and from both perspectives. Quality and impact are two concepts at the core of practice-oriented educational research that are mainly understood and addressed in one direction or from one perspective: quality is mainly considered from the research perspective and impact is mainly considered as pertaining to educational practice only. In line with Farley-Ripple et al. (2018), the main premise of this dissertation is that quality and impact should be considered as bifaceted where they were thus far considered too unifaceted. In addition, we contend that they should not only be considered in isolation, but also in relation to each other. In this dissertation, we treat quality and impact as bifaceted concepts by addressing quality of practice-oriented educational research from the perspectives of educational practice in addition to the perspectives from educational research, and by addressing impact in educational research in addition to impact in educational practice. Exploring the interrelatedness of these two key concepts of practice-oriented educational research can contribute to a more profound understanding of them. By approaching quality and impact as bifaceted concepts and in relation to each other, the existing criticisms of practice-oriented educational research concerning its quality, impact and potential to connect educational research and practice can

be addressed and potentially alleviated. By informing understanding of the quality and impact of practice-oriented educational research from complementary perspectives, this dissertation strives to contribute to realising the, in our perception, latent potential of practice-oriented educational research.

In this dissertation, we consistently use the term practice-oriented educational research, though multiple terms are in use in the literature. Oancea and Furlong (2007) use the term 'applied and practice-based research' which they define as 'an area situated between academia-led theoretical inquiry and research-informed practice, and consisting of a multitude of models of research explicitly conducted in, with, and/or for practice' (p. 124). The British Educational Research Association (Wyse, Brown, Oliver, & Poblete, 2018) uses the term 'close-to-practice research' which it defines as 'research that focusses on aspects defined by practitioners as relevant to their practice, and often involves collaborative work between practitioners and researchers' (p. 1). The Netherlands Initiative for Educational Research (NRO) defines practice-oriented educational research as 'research originating from a question in educational practice and formulated in collaboration with educational practice. Furthermore, the research is conducted in and with educational practice. During a practice-oriented research study, there is continual two-way interaction between researchers and educational professionals' (NRO, 2020, translated from Dutch), thereby emphasising impact in educational practice and research.

Based on the definitions provided above, we characterise practice-oriented educational research as *scientific research emanating from an issue in educational practice, being conducted in 'real' educational practice contexts with collaborative involvement of relevant stakeholders (i.e., researchers and teachers) and building on and aiming to contribute to both educational research and practice*. All scientific research that aligns with the outlined characteristics of practice-oriented educational research, including different research methodologies (e.g., action research, design-based research, lesson study) and research conducted by practitioners or by teams of practitioners and researchers (e.g., in school-university partnerships or professional development schools), is included in our definition of practice-oriented educational research.

1.2. Quality and impact of practice-oriented educational research

1.2.1. QUALITY

Two points of criticism of practice-oriented educational research, as stated above, concern its quality and impact. The first point is that practice-oriented educational research does not comply with traditional understandings of quality. In response, there is a growing body of scientific literature that argues for a distinct understanding of quality of practice-oriented educational research (Anderson & Herr, 1999; Oancea & Furlong, 2007; Verschuren, 2009; Ros & Vermeulen, 2010; Heikkinen, de Jong, & Vanderlinde, 2016). These and other authors (e.g., Elliot, 2007; Hammersley, 2008; Newton & Burgess, 2008; van Veen, 2012; Akkerman, Bronkhorst & Zitter, 2013; Oolbekink-Marchand, van der Steen, & Nijveldt, 2014) contend that this understanding of quality should align with the purpose of research. For practice-oriented educational research, this entails that quality should align with the intended aim to contribute to educational research and practice and, therefore, should be based on both scientific and practical concerns. The perspectives on quality in the literature reflect the twofold aim of practice-oriented educational research. However, these are principally the perspectives of educational researchers. Although the value of teachers' perspectives is recognised (e.g., Gore & Gitlin, 2004; Ratcliffe, Bartholomew, Hames, Hind, Leach, Millar, & Osborne, 2005; Cochran-Smith & Lytle, 2009; Winch, Oancea, & Orchard, 2015), teachers' perspectives are so far hardly taken into consideration. Due to differing epistemological beliefs (Joram, 2007), perceptions of research (Ratcliffe et al., 2005; Kemmis, 2012), activities and orientations (Hammersley & Gomm, 2002) and ways of using and validating research (Bartels, 2003; Anwaruddin, 2019), it is to be expected that teachers' perspectives on the quality of practice-oriented educational research differ from researchers' perspectives. Since practice-oriented educational research is intended to address both researchers and teachers, the quality of practice-oriented educational research should be understood and addressed from both perspectives. By identifying a practice perspective on the quality of practice-oriented educational research, this dissertation strives to contribute to a bifaceted understanding of the quality of practice-oriented educational research.

1.2.2. IMPACT

The second point of criticism of practice-oriented educational research concerns its impact. Expectations of the impact of practice-oriented educational research in educational practice are high due to its characteristics as emanating from an issue in educational practice, being conducted in educational practice with the collaborative involvement of teachers and its explicit aim to contribute to educational practice. However, there is limited empirical research and hence limited empirical evidence on the achieved impact of practice-oriented educational research (Bates, 2002; Coburn, 2003; Levin, 2013; Cain & Allan, 2017). Furthermore, although impact on educational research is also an explicit aim of practice-oriented educational research, this aim is scarcely included in current discussions on the impact of practice-oriented educational research, obscuring what this impact is or could be. Addressing the impact of practice-oriented educational research is complicated due to a lack of a shared understanding in the literature of what impact is, leading to a proliferation of ideas on the concept. A conceptualisation of impact that builds on the twofold aim of practice-oriented educational research can resolve these issues. The conceptualisation can provide a common frame of reference for stakeholders in practice-oriented educational research to address and discuss the aspired and achieved impact of practice-oriented educational research. By establishing a conceptual framework of impact as bifaceted, i.e., including impact in educational practice and research, this dissertation sets out to contribute to a shared understanding of impact of practice-oriented educational research.

The high expectations of the impact of practice-oriented educational research originate from its characteristics that allow for correspondence between a research study and the intended areas of impact (i.e., educational practice and research). It is widely established that multiple factors can affect the achievement of impact of practice-oriented educational research, such as characteristics of the school organisation and culture, the role of the principal, teacher beliefs, motivations, expectations and interpretations, issues of dissemination and timing, and the perceived gap between educational research and practice (Burkhardt & Schoenfeld, 2003; Gore & Gitlin, 2004; Berger, Boles, & Troen, 2005; Brown, 2005; Broekkamp & van Hout-Wolters, 2007; Cordingley, 2008; Oates, 2008; Dagenais et al., 2012; Anwaruddin, 2015; Lee & Seashore Louis, 2019; Liou, Canrinus, & Daly, 2019). However, there is debate on if and how the characteristics of practice-oriented educational research studies themselves

contribute to achieving impact in educational practice and research, leaving uncertainty on whether practice-oriented educational researchers can design their studies for impact. This dissertation explores if and how characteristics of practice-oriented educational research studies contribute to impact in educational practice and research.

1.2.3. INTERRELATEDNESS OF QUALITY AND IMPACT

Practice-oriented educational researchers want to conduct high quality research while simultaneously achieving impact in educational research and practice. The implicit assumption is that meeting certain quality concerns can support the achievement of impact. However, it is equally conceivable that quality and impact are conflicting considerations in practice-oriented educational research studies between which researchers must choose (cf. Hammersley, 2003). There are also numerous examples of high-quality research with low impact and low-quality research with high impact. This raises the question if and how quality and impact are interrelated. These questions receive limited attention in discussions on practice-oriented educational research, even though it is to be expected that the interrelatedness between quality and impact has consequences for practice-oriented educational research. For example, whether quality is conditional, opposite, or independent of impact can determine if, when and how quality and impact are addressed in a practice-oriented educational research study. This dissertation explores the interrelatedness of quality and impact of practice-oriented educational research to increase understanding on this issue.

1.3. Research aim

Considering the gaps in current understanding of the quality and impact of practice-oriented educational research and their interrelatedness, it is difficult to realise the full potential of practice-oriented educational research in terms of quality and impact. This dissertation sets out to contribute to understanding of the concepts of quality and impact of practice-oriented educational research and their interrelatedness. This can support practice-oriented educational researchers in addressing quality and impact in their research, inform debates on these issues within the community of practice-oriented educational researchers, and assist subsidy providers to set up calls that elicit research proposals that address issues of quality and impact to satisfactory extents. The aim of this dissertation is to address quality and impact of practice-oriented educational research as bifaceted in order (i) to increase conceptual understanding of the quality and impact of

practice-oriented educational research as well as their interrelatedness, and (ii) to identify how quality, impact and their interrelatedness can correspondingly be actualised.

The overall research question is:

> *How can the quality and impact of practice-oriented educational research and their interrelatedness be conceptualised and actualised?*

The answer to this research question identifies how quality, impact and their interrelatedness can be conceptualised and how these conceptualisations can be operationalised or used to increase the quality and impact of practice-oriented educational research. Implications are relevant for research practice and policy concerning practice-oriented educational research.

To answer the overall research question, four studies have been conducted. These studies have been guided by more specific sub-questions and qualitative methodologies fitted to the sub-questions posed. Brief outlines of the four studies are provided in paragraph 1.5.

1.4. Research context

1.4.1. PRACTICE-ORIENTED EDUCATIONAL RESEARCH IN THE NETHERLANDS

In the Netherlands, educational researchers value the orientation of educational research towards educational practice, and, according to van Braak and Vanderlinde (2012), the majority of educational researchers considers contributing to educational practice the primary aim of educational research. The growing popularity of practice-oriented educational research in the Netherlands is reflected in the increasing amount of funding for practice-oriented educational research. Since the establishment of the Netherlands Initiative for Education Research (NRO) in 2014, over half of its budget is spent on practice-oriented educational research; the rest is spent on fundamental and policy-oriented research, and on research that combines practice-oriented, fundamental and/or policy-oriented research (NRO, 2018). Since 2007, there is also an increase in governmental policy to stimulate teachers to conduct research. The main rationale for this is to increase the quality of education through professional development of teachers, educational innovation by these teacher-researchers,

and increasing research cultures within schools. A substantial amount of funding is spent by the Dutch Ministry of Education, Culture and Science (Ministry of OC&W) and the Dutch Research Council (NWO) on grants for doctoral and postdoctoral research by primary, secondary, middle, and higher education teachers (van Bergen, Groot, & van der Wel, 2018). Almost half of the teacher research projects funded by NWO and all teacher research projects funded by the Ministry of OC&W (e.g., Dudoc Bèta and Alfa, PromoDoc and Postdoc-VO) are practice-oriented educational research studies focussed on educational, didactical, or pedagogical topics.

Of the four studies presented in this dissertation, the first three are conducted in the context of the Postdoc-VO project, one of the initiatives that are in line with the policy of the Ministry of OC&W to stimulate teachers to conduct practice-oriented educational research. The fourth study is conducted in the practice-oriented educational research community in the Netherlands.

1.4.2 CONTEXT OF THE POSTDOC-VO PROJECT

The Postdoc-VO project offers scholarships to teacher-researchers with a doctoral degree to conduct a postdoctoral research project. The main rationale for this project is to utilise the research capacities of teachers with a doctoral degree to further improve educational practice and stimulate a research culture within the teacher-researchers' schools.

In 2014, a pilot of the Postdoc-VO project was launched in which ten secondary science and mathematics teachers were granted scholarships to conduct a practice-oriented educational research project on a self-selected educational issue within their own school for two days a week for two or three years while maintaining their teaching positions for the remaining time. The teacher-researchers received support from a self-selected university-based educational researcher.

The Postdoc-VO pilot project provided the context for three of the studies in this dissertation for two main reasons. First, in line with the twofold aim of practice-oriented educational research, the aim of the postdoctoral research projects was to contribute to educational practice and to educational research. Second, the postdoctoral teacher-researchers were experienced teachers and experienced researchers. It was therefore expected that they could ensure alignment of their studies with both educational practice and research, leading to impact in both

areas. Owing to their experiences and dual positions as teachers and researchers, the teacher-researchers were also expected to be able to consider quality from both a research and practice perspective.

1.5. Overview of the dissertation

This dissertation consists of four studies and a concluding chapter. In the subsequent Chapters 2 to 5 the individual studies are presented. The concluding Chapter 6 answers the overall research question by reflecting on the results of the individual studies, including implications for research practice and policy concerning practice-oriented educational research. Brief outlines of the four individual studies are provided in this section.

Study 1: Teacher-researchers' quality concerns for practice-oriented educational research (Chapter 2)

The aim of this study is to identify teacher-researchers' perspectives on the quality of practice-oriented educational research and to analyse how these differ from the research perspective. The research question is:

> *What are teacher-researchers' perspectives on the quality of practice-oriented educational research and how do these differ from the research perspective in the literature?*

In a qualitative empirical study, the perspectives of ten purposefully selected postdoctoral teacher-researchers from the Postdoc-VO pilot are elicited using individual reflections, small-group discussions and semi-structured interviews. The data are analysed following an informed grounded theory approach, resulting in an overview of quality concerns for practice-oriented educational research from teacher-researchers' perspectives and how these differ from the research perspective.

Study 2: Towards a shared understanding of the impact of practice-oriented educational research: scope, nature and progress (Chapter 3)

The aim of this study is to contribute to a shared understanding of the impact of practice-oriented educational research by establishing a conceptual framework. Impact is operationalised in the three dimensions scope, nature and progress, i.e., the who, what and when of change. These dimensions are theoretically elaborated and empirically substantiated using a qualitative study into the impact

of the ten practice-oriented educational research studies from the Postdoc-VO pilot. The research question of the empirical study is:

> *What do teacher-researchers describe as the aspired and achieved impact of their practice-oriented educational research studies in educational practice and research?*

Data are collected from individual reflections, small-group discussions, and semi-structured interviews with the teacher-researchers. The data are analysed deductively, using a predefined coding scheme consisting of the dimensions of impact developed in the theoretical framework while maintaining an open view to identify new (sub)dimensions that could emerge from the data. The study results in a bifaceted conceptualisation of impact.

Study 3: Designing for impact? Identifying characteristics of teacher-researchers' practice-oriented educational research studies with impact (Chapter 4)

The aim of this study is to identify if and how the characteristics of practice-oriented educational research contribute to achieving impact. The research questions are:

> *What is the achieved impact, in terms of scope, nature and progress, of teacher-researchers' practice-oriented educational research studies, according to the teacher-researchers and local stakeholders?*
>
> *How can the scope, nature and progress of the achieved impact of teacher-researchers' practice-oriented educational research studies be related to the characteristics of practice-oriented educational research?*

In a qualitative multiple-case study, the achieved impact of three purposefully selected (out of the same ten) practice-oriented educational research studies conducted by the postdoctoral teacher-researchers is identified using interviews with the teacher-researchers and local stakeholders in the studies' educational research and practice contexts. In individual case analyses, the achieved impact is analysed based on the conceptualisation of impact resulting from Study 2. In a subsequent cross-case analysis, the scope, nature and progress of the achieved impact are related to the characteristics of the teacher-researchers' studies. This

study culminates in a description of how practice-oriented educational research studies can be designed for impact.

Study 4: The interrelatedness of quality and impact of practice-oriented educational research: an empirical exploration (Chapter 5)

The aim of this study is to explore the interrelatedness of quality and impact of practice-oriented educational research. The research question is:

> *How do perspectives on the interrelatedness of quality and impact of practice-oriented educations research differ?*

Informed by possible forms of interrelatedness of quality and impact from the literature, six purposefully selected experts on practice-oriented educational research from the Dutch educational research community are interviewed about their perceptions of the interrelatedness. The data are analysed following an informed grounded theory approach, leading to the identification of how perceptions of the interrelatedness of quality and impact of practice-oriented educational research differ.

2. TEACHER-RESEARCHERS' QUALITY CONCERNS FOR PRACTICE-ORIENTED EDUCATIONAL RESEARCH

ABSTRACT
Practice-oriented educational research is increasingly gaining traction in educational research due to its intention to contribute to both educational research and educational practice. Educational researchers have established quality concerns that practice-oriented educational research should meet in order to realise this intention. We argue that teachers' quality concerns probably differ from researchers' concerns. This may explain why practice-oriented educational research faces challenges concerning its contribution to educational practice. The aim of this study is to identify teacher-researchers' perspectives on the quality of practice-oriented educational research and to analyse how these differ from the research perspective. In a qualitative empirical study, individual reflections, small-group discussions and semi-structured interviews of ten purposefully selected teacher-researchers are analysed following a so-called informed grounded theory approach. The results of this study show that the teacher-researchers' quality concerns overlap with the quality concerns commonly held by researchers, but they broaden the meaning of some quality concerns, add new concerns and exclude others. Taking their common quality concerns as a starting point, close collaboration between researchers and teachers could decrease researchers' challenges concerning legitimacy and relevance of their work and increase teachers' use of research in educational practice.

KEYWORDS
Quality concerns; practice-oriented educational research; teacher-researchers; practice perspective; research perspective

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2.1 Introduction

Practice-oriented educational research is increasingly gaining traction in educational research due to its explicit intention to build on and contribute to both educational research and educational practice. Oancea and Furlong (2007, p. 124) define practice-oriented educational research as 'situated between academia-led theoretical inquiry and research-informed practice, and consisting of a multitude of models of research explicitly conducted in, with, and/or for practice.' Examples of practice-oriented research approaches are design-based research (e.g., van den Akker, Gravemeijer, McKenney, & Nieveen, 2006), action research (e.g., Townsend, 2013), and lesson study (e.g., Watanabe, 2002). Since practice-oriented educational research is intended to contribute to educational research and practice, several researchers argue that quality criteria for this kind of research should reflect this twofold objective. Oancea and Furlong (2007), Verschuren (2009), and Ros and Vermeulen (2010) discuss that the quality of practice-oriented educational research should be assessed based on scientific and practical standards. On a more general level, Gibbons, Limoges, Nowotny, Schwartzman, Scott and Trow (1994) state that for application driven research 'traditional scientific criteria will have to be qualified by other criteria that claim equal legitimacy' (Gibbons et al., 1994, p. 153). From these arguments and the consensus that practice-oriented educational research is intended to address teachers in addition to researchers, we contend that the quality of practice-oriented educational research should be addressed from the perspectives of both researchers and teachers.

Discussions in the current literature of the quality of practice-oriented educational research are predominantly informed by researchers' perspectives. The value of teachers' perspectives is widely recognised (e.g., Gore & Gitlin, 2004; Ratcliffe, Bartholomew, Hames, Hind, Leach, Millar, & Osborne, 2005; Cochran-Smith & Lytle, 2009; Winch, Oancea, & Orchard, 2015). Although there are empirical studies of teachers' perspectives on educational research, we could not find empirical research studies informing us about teachers' perspectives on the quality of educational research in general or practice-oriented educational research in particular. Researchers and teachers typically operate in two distinct worlds and pursue fundamentally different activities (Hammersley & Gomm, 2002). Notably, researchers study educational practice from an outsider perspective in contrast to teachers, who operate in educational practice and view

it from an insider perspective (Kemmis, 2012). Owing to their differing activities and frames of reference, researchers and teachers have different perspectives on educational research. They hold different epistemological beliefs (Joram, 2007) and have different ways of using and validating research (Bartels, 2003; Ratcliffe et al., 2005). From this, it can be inferred that researchers and teachers have differing perspectives on the quality of practice-oriented educational research. Insight into teachers' perspectives enables practice-oriented educational researchers to take these into account in their research and research reports (Hammersley & Gomm, 2002). This can contribute to making practice-oriented educational research more relevant to both research and practice (Gore & Gitlin, 2004; Kemmis, 2012).

This study identifies the perspectives of purposefully selected teacher-researchers on the quality of practice-oriented educational research, and analyses how these differ from the research perspective portrayed in the current literature. In the next section, the concept of quality, research perspectives on the quality of practice-oriented research and teachers' perspectives on educational research are discussed. Subsequently, a practice perspective on the quality of practice-oriented educational research is identified in a qualitative empirical study in which teacher-researchers were the informants.

2.2 Theoretical framework

2.2.1 THE CONCEPT OF QUALITY

There is no unified definition of quality, in research or in general. Despite this lack of a definition, Wittek and Kvernbekk (2011) make three observations about the concept. First, quality is considered a property as it is something that can be attributed to something else. Second, quality implies a value judgment and is often expressed in quantitative terms, e.g., quality can be high or low, increase or decrease. Third, quality can be viewed as subjective, i.e., in the eye of the beholder, or as objective, i.e., an entity that can be separated into specific measurable parts.

In discussions of the quality of educational research in the current literature, quality is mostly portrayed as objective and defined in terms of criteria that are considered to be explicit, comprehensive and observable (Hammersley, 2007) for instance, internal validity, applicability and cumulativity. However, Hammersley disputes whether the quality of educational research can simply be

portrayed in terms of explicit and concrete quality criteria. He presumes that there is always judgment involved based on a personal frame of reference, implying a subjective view of the quality of educational research. Oancea and Furlong (2007) also dismiss the idea of universal quality criteria or standards for educational research, because such universal criteria or standards do not recognise diversity of perspectives and do not do justice to the great diversity of educational research.

Furthermore, just like quality itself, quality criteria have no fixed meanings. For example, a well-known criterion like internal validity is variously described as 'correspondence with empirical reality' (Verschuren, 2009, p. 15), 'whether results found by the researcher are reliable and accurate for the phenomena that are being studied' (Ros & Vermeulen, 2010, p. 4) and 'isomorphism or verisimilitude between the data of an inquiry and the phenomena those data represent' (Guba, 1981, p. 80). Even when criteria are described in discrete terms and arranged in separate parts, there will never be absolute clarity about when they apply and when they do not apply (Wittek & Kvernbekk, 2011). For example, the quality criterion 'cumulativity' is generally meant to indicate that a study builds on previous knowledge and adds something new to the scientific knowledge base. However, how much previous knowledge should be integrated in a study? Few would consider it sufficient to build on one previous study. What if no recent studies are included or if only recent studies are included? What if only non-peer-reviewed references are included? Owing to this lack of clarity, discussions of the quality of educational research will always involve some form of subjective judgment rooted in personal frames of reference (Hammersley, 2007).

From this line of reasoning, it becomes evident that only stipulative definitions of quality are feasible. Stipulative definitions are fitting for a particular context and discourse, within a certain frame of reference (Wittek & Kvernbekk, 2011). This makes definitive shared definitions of the quality of practice-oriented educational research from either perspective troublesome. The perspectives on quality discussed in this study are therefore stipulative definitions. They are snapshots of current literature and the particular context of the empirical study and should be considered as tentative. We therefore claim modesty for the scope of the results of our study.

2.2.2 RESEARCH PERSPECTIVES ON THE QUALITY OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

In the literature, different overviews of quality criteria for practice-oriented educational research are presented. These lists of quality criteria differ in content, length and specificity. Generally speaking, two kinds can be discerned: the first focus on the quality of a research study in itself and (potential) effects on educational practice; the second focus on the procedures of research[1]. For the purpose of our study, we selected three exemplary publications of the first kind. First, Oancea and Furlong (2007, p. 125) describe three so-called 'domains of quality' for practice-oriented educational research; an epistemic domain on methodological and theoretical soundness of research; a technical and economic domain on the (potential) value for the use of research; and a practical domain on the practical wisdom and (potential) enhancement of action by practitioners. They note that the specific quality criteria can vary for each practice-oriented research study, but that aspects from all domains of quality should always be considered. Second, Verschuren (2009) discusses methodology for practice-oriented research in the social sciences. This contribution is considered relevant owing to its elaborate discussion of quality criteria. He distinguishes between theory-oriented and practice-oriented quality criteria, or as he states it 'between epistemological and implementary validity, or between truth and utility' (p. 24). Third, Ros and Vermeulen (2010) establish quality criteria for practice-oriented educational research based on Oancea and Furlong (2007) and Verschuren (2009). They distinguish between scientific research standards and usefulness standards.

Table 2.1 provides an overview of the quality concerns for practice-oriented educational research in the three exemplary publications and the resulting research perspective on the quality of practice-oriented educational research. The starting point for the overview is the 'four major concerns relating to trustworthiness' of educational research by Guba (1981, p. 79). According to Guba, his four concerns about trustworthiness are independent of research paradigms and methods. Even though he translates the concerns into different

[1] For example, Anderson and Herr (1999) and Heikkinen, de Jong, and Vanderlinde (2016) elaborate quality criteria for practitioner research that can be regarded as practice-oriented educational research executed by teachers. However, owing to the focus of their criteria on the procedures of research, they do not address the quality of a research study in itself.

quality criteria for rationalistic and naturalistic research and recommends different strategies and methods for quality control in both paradigms, the quality concerns remain the same. Guba's quality concerns are: truth value, i.e., the extent to which the results of a study are a correct representation of (experienced) reality; applicability, i.e., the extent to which the results of a study have applicability in other contexts and/or with other subjects; consistency, i.e., the extent to which a study and its results can be consistently repeated if the research were replicated; and neutrality, i.e., the extent to which the results of a study are solely a function of the subjects and conditions of the research.

The four quality concerns expressed by Guba (1981) fit in the domain of research-focussed criteria as distinguished by Verschuren (2009) and Ros and Vermeulen (2010), and the epistemic domain of Oancea and Furlong (2007). The criteria in these domains show considerable overlap with Guba's quality concerns 'truth value', 'applicability' and 'consistency'. The criterion 'neutrality' is addressed only by Guba; the criterion 'cumulativity' is addressed only by the other authors. Both criteria are included, as they differ substantially from the other three criteria.

The remaining quality criteria fit within the domain of practice-focussed quality criteria. The criteria 'comprehensibility', 'acceptability' and 'legitimacy' are present in the lists of quality criteria by both Verschuren (2009) and Ros and Vermeulen (2010), and they overlap with the practical domain of Oancea and Furlong (2007). They are therefore included in the research perspective. Following Ros and Vermeulen, 'acceptability' and 'legitimacy' are combined into one criterion that we term 'acceptability'. The practical domain of Oancea and Furlong (2007) also refers to the transformation and growth of practitioners. This aligns with the learning opportunities as described by Ros and Vermeulen (2010) and the criterion 'research as a learning process' as described by Verschuren (2009). This marks a third criterion of 'value for learning'. A fourth criterion is derived from the technical domain of Oancea and Furlong (2007) and the criteria for ´type of knowledge´ by Verschuren (2009). These refer to the potential for and conditions of use to solve practical issues and are combined in the criterion of 'usability'. The last criterion is 'economic value', as derived from the economic domain of Oancea and Furlong (2007) about research's 'value for money'.

Table 2.1. Overview of the quality concerns in the literature and the resulting quality concerns from the research perspective.

Guba (1981)	Oancea & Furlong (2007)	Verschuren (2009)	Ros & Vermeulen (2010)	Quality concerns from the research perspective	
	Epistemic domain	Internal scientific (theory-oriented) criteria	Scientific research standards	Research-focussed quality concerns	
Truth value				Truth value	Extent to which the results of a study are accurate and reliable, and correspond with empirical reality
Applicability	Trustworthiness Propriety Transparency & explicitness	Internal validity External validity Verifiability	Internal validity External validity Accountability	Applicability	Extent to which the results of a study are generalisable to other contexts and/or other subjects
Consistency				Consistency	Extent to which a study's research design and methodological procedures are transparent and explicit so that it can be replicated

Neutrality				Neutrality	Extent to which findings are a function solely of subjects and conditions of research
	Contribution to knowledge	Cumulativity	Cumulativity	Cumulativity	Extent to which a study builds on and contributes to scientific knowledge
	Practical domain	External scientific (practice-oriented) criteria[1]	Usefulness standards	Practice-focussed quality concerns	
	Plausibility Engagement Reflexivity, deliberation & criticism Receptiveness	Needs of stakeholders Comprehensibility Acceptability Legitimacy	Comprehensibility Acceptance & legitimacy	Comprehensibility Acceptability	Extent to which practitioners can understand the research (results) Extent to which practitioners find the research (results) legitimate
	Transformation & personal growth	Research as learning process	Learning opportunities	Value for learning	Extent to which research (results) offer opportunities for professional development and capacity building

Technical domain	Type of knowledge criteria		
Fitness to purpose			
Salience/timeliness	Holism		
Specificity & accessibility	Interdisciplinarity	Usability	Extent to which research (results) provide solutions to practical problems
Concern for impact	Context restraint		
Flexibility & operationalisability	Profoundness		
	Manipulability		
Economic domain			
Marketability & competitiveness			
Cost		Economic value	Extent to which research (results) contribute to economic advantages or (inter)national competitiveness
Auditability			
Feasibility			
Added value/brand			

Note: [1] Verschuren's criteria for 'object of research' are excluded from this synthesis because they 'are not criteria, but features of the object that ask for methodological attention' (2009, p. 17).

Generally speaking, all authors seem to hold objective views of quality, transpiring from the lists of criteria that they portray. However, these lists can be considered subjective because different authors include different criteria and attach different meanings to similar criteria. Owing to this subjectivity and the objectivity that the term 'criteria' seems to imply, the term 'quality concerns', as established by Guba (1981), seems more appropriate and is used in this study from this point onwards. The overview of quality concerns as displayed in Table 2.1 covers the common ground in the current literature and can be considered a stipulative definition of the quality of practice-oriented educational research from the research perspective.

The concerns in Table 2.1 are purposefully briefly described. Fitting with a subjective view of quality, it is assumed that every beholder holds a personal view of the meaning of these quality concerns. Providing exhaustive descriptions of these concerns that fit with everyone's personal view would be impossible, because, depending on paradigm and epistemological beliefs, views can contradict. It would also be inappropriate to impose fixed meanings of these quality concerns, because every beholder is entitled to a personal view and no view is more legitimate than any other in this respect (Wardekker, 2000).

2.2.3 TEACHERS' PERSPECTIVES ON EDUCATIONAL RESEARCH

Teachers' perspectives on the quality of educational research in general or practice-oriented research in particular could not be found in the current literature. However, teachers' perceptions of educational research in general are addressed and provide insights into teachers' concerns. Studies of this issue show a fairly uniform picture of what the aim and function of research should be according to teachers. First, research findings should resonate with teachers' professional experience in educational practice (Everton, Galton, & Pell, 2000; Labaree, 2003; Ratcliffe et al., 2005) so that they can integrate research-based knowledge into their personal knowledge base without too much difficulty (Bartels, 2003). If research findings conflict with teachers' experience, teachers are inclined to oppose these findings and to give precedence to their own experience. They feel free to dismiss research-based information because, in their views, research does not have greater authority than their own experiences (Cain, 2017). Furthermore, teachers tend to have a case-based way of thinking about educational practice, which means that they consider each teaching situation to be unique (Joram, 2007). This leads teachers to dismiss general research-based

knowledge and to assign privilege to personal professional experience (Labaree, 2003).

Second, research should apply to teachers' contexts (Gore & Gitlin, 2004; Vanderlinde & van Braak, 2010), which means that problems addressed in research should align with problems experienced in practice, and results should offer solutions to problems experienced in teachers' specific contexts.

Third, research should make clear how findings or research-based interventions are to be used in educational practice (Gore & Gitlin, 2004; Ratcliffe et al., 2005). Everton, Galton, and Pell (2000) found in their study of teachers' perspectives on educational research that, according to teachers, research should focus on classroom action, specific aspects of teaching and demonstrate effective learning. Teachers need specific information about the components of an intervention, student engagement and measurements of success (Carnine, 1995) to be able to use the results of research in practice. This aligns with studies of teacher decision-making in educational innovation that show that proposals for educational change should clearly describe procedures for classroom practice, be congruent with teachers' perceptions of educational practice, and have benefits that outweigh the costs of changing educational practice (Doyle & Ponder, 1977).

Last, research findings should be accessible for teachers (Carnine, 1995; Gore & Gitlin, 2004). This means that teachers should be able to access research reports physically or digitally, and that the level of difficulty and complexity of research reports should align with teachers' levels of understanding. According to Bartels (2003) and Vanderlinde and van Braak (2010), teachers experience difficulty with language and jargon in research articles.

Unsurprisingly, teachers' primary focus is their own educational practice. In contrast to researchers, who establish quality criteria for educational research on a community level, teachers establish criteria for quality on an individual level (Bartels, 2003) based on their own professional knowledge and experience. It also shows that teachers are looking for a different kind of knowledge from what (most) research has to offer (McIntyre, 2005). Teachers are looking for pedagogical (content) knowledge instead of propositional knowledge, and they assign priority to the practicality of research in contrast to researchers who are looking for clarity, coherence and truth. From these differences, it can be

discerned that teachers have different concerns about the quality of practice-oriented educational research from researchers. Their concerns about educational research in general, as described above, provide some preliminary directives for their concerns about the quality that practice-oriented educational research should address to find resonance with teachers.

2.3 Research aim

The aim of this study is to identify teachers' perspectives on the quality of practice-oriented educational research and to analyse how these differ from the research perspective. To achieve this goal, we purposefully selected experienced teacher-researchers as informants in a qualitative empirical study. Given their experience as both teachers and researchers and their current positions in which they teach and conduct research concurrently, we expect these teacher-researchers to be able to explicate perspectives on quality grounded in experience. This study formulates a stipulative definition of quality concerns from the practice perspective, based on teacher-researchers' frames of reference.

2.4 Method

2.4.1 CONTEXT

After several initiatives stimulating secondary school teachers to conduct PhD research, and finding that upon completion teachers left their schools to pursue other careers, the ministry of Education, Culture and Science in the Netherlands offered subsidies to create postdoctoral positions in secondary schools for science and mathematics teachers. Teachers with a PhD could apply for a grant to spend two days a week on a postdoctoral research project for two or three years while maintaining their teaching positions in secondary education. The research projects were conceived from the beginning to contribute to the advancement of both educational practice and research. Consequently, there was a need to attend to the concerns and needs of both educational practitioners and researchers. Owing to their backgrounds and current positions, it was expected that the recipients of the grant were able to consider both the research and the practice perspectives on quality. Therefore, the ten recipients of the postdoctoral grants were purposefully selected (Patton, 2002) as informants for this study. In conversations with the individual teacher-researchers, the first author explained the purpose of the study and their role as informants. The teacher-researchers gave oral consent to participate in this study.

2.4.2 INFORMANTS

The ten teacher-researchers hold doctoral degrees in either science, mathematics, or science or mathematics education, and have between five and twenty-one years of experience as a science or mathematics teacher in secondary education. Owing to their experience as researchers, the teacher-researchers have a clear perception of what research is (cf. Laroes, Bronkhorst, Akkerman & Wubbels, 2018) and are familiar with the research perspective on quality; owing to their experience as teachers, they are able to provide a teacher's perspective on quality. The teacher-researchers' research projects were all design-based research studies that addressed a current issue within science or mathematics education in the teacher-researchers' schools. The research proposals were written by the teacher-researchers in close collaboration with their school leader and colleagues, and a university-based researcher, thus ensuring the embeddedness of the research project within the practice context and current research respectively. Table 2.2 provides an overview of the informants and their research projects.

Table 2.2. Overview of the teacher-researchers and their research projects.

Teacher-researcher[1]	School subject	Title of postdoctoral research project
Anna	Chemistry	Interrelatedness of context-based chemistry education and student needs
Alex	Biology	A practical approach to within classroom differentiation using videos
Daniel	Mathematics	Differentiation according to students' interest in mathematics education
John	Biology	Influence of knowledge on neurological processes on teachers' classroom practice
Leonard	Physics	Multidisciplinary science contexts for flexible use of concepts
Mark	Biology	Professional development in a teacher development team focused on design, use and evaluation of context-concept education
Mike	Biology	Use of data to enhance teachers' teaching practices
Oscar	Physics	Modelling in physics education
Peter	Physics	Technical internships to enhance students' motivation for science
Tessa	Chemistry	Enhancing language proficiency of grade 10 students in chemistry education

Note: [1] All names are pseudonyms

2.4.3 DATA COLLECTION

Data were collected from the teacher-researchers using individual reflections, small group discussions, and individual semi-structured interviews, leading to method triangulation (Miles & Huberman, 1994). Multiple methods for data collection were used to create multiple and different opportunities for the informants to reflect on the quality of practice-oriented educational research. The individual reflections and small group discussions provided initial opportunities for the teacher-researchers to articulate their quality concerns. These articulated concerns provided input for informed interviews to gain deeper understanding of their quality concerns.

The teacher-researchers had bimonthly meetings to discuss the progress of their research projects and difficulties that they experienced. During one of these meetings, one year after starting their research projects, the teacher-researchers were asked to write an individual reflection based on three guiding questions. They were asked what they considered to be important concerning quality of practice-oriented educational research, what they thought was good about their own research and why, and what they did to ensure the quality of their own research and why they did it that way. There were no restrictions on what the teacher-researchers could write down. The individual reflection was followed by small group discussions with two or three teacher-researchers. They were asked to share their individual reflections and to discuss differences and similarities.

Thereafter, the research-focussed concerns from the research perspective, as described in Table 2.1 (e.g., truth value, applicability, consistency, neutrality, and cumulativity) were introduced to the teacher-researchers. It was assumed that the teacher-researchers were already familiar with these quality concerns as they were experienced researchers. Therefore, it was expected that the introduced concerns provided no new information, but would trigger their thinking about these quality concerns. The teacher-researchers were asked to write down in a second individual reflection parallels and differences between the research-focussed concerns from the research perspective and their own perspective on quality, including any additional quality concerns from their perspective as teachers. The individual written reflections were collected, and the small group discussions were recorded and summarised.

The practice-focussed quality concerns as described in Table 2.1 (e.g., comprehensibility, acceptability, usability, value for learning, and economic value)

refer to the effects on educational practice, but are based on a research perspective. These quality concerns were assumed to be less familiar to the teacher-researchers, and it was expected that the teacher-researchers would hold different quality concerns in this domain. The practice-focussed concerns were therefore not introduced to the teachers-researchers, because we wanted them to reflect on this with open minds.

The outcomes of the individual reflections and the small group discussions guided the semi-structured interviews with the individual teacher-researchers five months after the meeting. The teacher-researchers were asked clarifying questions concerning their individual reflections (e.g., what they meant by certain terms), why they considered the quality concerns in their individual reflections to be important and how they addressed them in their research. Subsequently, they were asked what they considered important concerning the quality of research of others: research of the other postdoctoral teacher-researchers and research in scientific journals. They were asked what aspects they paid attention to and why. All interviews were recorded and transcribed.

2.4.4 DATA ANALYSIS

Data analysis was based on an informed grounded theory approach as established by Thornberg (2012). Building on the impossibility of pure inductive reasoning as advocated in the classic grounded theory approach of Glaser and Strauss (1967) and on the analytical value of abduction in addition to induction, Thornberg expands Charmaz' (2014) constructivist grounded theory approach by including extant theories as sources of inspiration during the data analysis and theory building procedures. This results in a theory 'thoroughly grounded in data by GT methods while being informed by existing research literature and theoretical frameworks' (Thornberg, 2012, p. 249). In this study, the research-focussed quality concerns as described in Table 2.1 are used as sensitising concepts (Bowen, 2006) to provide a starting point for our analysis and ensuing grounded theory. During analysis and theory building, we move beyond the initial sensitising concepts by changing and expanding them, leading to a theory grounded in the data.

To gain an overview of the variety of teacher-researchers' quality concerns, the first step of data analysis was the open coding (Charmaz, 2014) of all data using the five research-focussed quality concerns as described in Table 2.1 as sensitising concepts. From this initial coding, it became apparent that their quality

concerns often pertained to specific aspects of research instead of to research as a whole. In subsequent coding, we differentiated between concerns for research as a whole and three aspects of research, i.e., intervention, method and results. The initial codes for quality concerns were sorted and clustered using the method of constant comparison. This resulted in thirteen quality concerns, among which five that were inspired by the used sensitising concepts.

It should be noted that the teacher-researchers used various terms to describe similar quality concerns and vice versa. For example, descriptions of quality concerns pertaining to 'consistency' were also termed 'imitability', 'reproducibility' and 'repeatability'. The other way around, the teacher-researchers used similar terms for different descriptions of quality concerns. For example, 'cumulativity' was used to refer to contributing to scientific and practical knowledge, but also to refer to contributing something extra to student learning on top of the regular curriculum. To overcome this issue, it was decided to ignore the specific terms used by the teacher-researchers and to focus on their descriptions of quality concerns.

The second step was focussed coding (Charmaz, 2014) of all data for aspects of research and quality concerns. The aspects of research and quality concerns resulting from the first step of data analysis were used as codes. All relevant quotations were coded with both types of codes. Quotations that did not address a specific research aspect were coded as referring to research as a whole. Subsequently, each coded quotation was summarised in a descriptive statement. Table 2.3 shows an example of a coded quotation and the resulting descriptive statement.

As a third step, all descriptive statements of each teacher-researcher were collected in a matrix (Miles, Huberman & Saldaña, 2014) to gain an overview of the results per teacher-researcher. Similar descriptive statements in a cell were merged, but multiple descriptive statements remained when they were dissimilar. The fourth step was to combine the individual matrices of the whole group of teacher-researchers into one overview matrix (Miles, Huberman & Saldaña, 2014). Again, similar descriptive statements in a cell were merged, but multiple descriptive statements remained in one cell when they were dissimilar. All descriptive statements of the thirteen quality concerns were subjected to close scrutiny using the method of constant comparison to identify overlap between quality concerns. To ensure uniqueness of categories, the revealed overlap in

meaning between quality concerns led to merging of the thirteen quality concerns into seven.

Table 2.3. Example of coding.

Quotation from personal reflection by Leonard	Step 2: Codes + descriptive statement
What I find important concerning quality is that a study is embedded in other relevant research and embedded in educational practice. A study should apply what is already known.	*Aspect of research:* research as a whole Quality concern: cumulativity *Descriptive statement:* study is embedded in scientific and practical knowledge

All data were checked against the seven remaining quality concerns to ensure completeness and overall coverage. All quotations fitted with the seven quality concerns. The overview of the quality concerns of the teacher-researchers was therefore considered representative of the data.

Validation of the data analysis was done using an audit procedure as developed by Akkerman, Admiraal, Brekelmans and Oost (2006) and extended by de Kleijn and van Leeuwen (2018). The summative audit was performed by a peer researcher who was not involved in the study. Being a teacher-researcher herself, the auditor was sensitive to the teacher perspective in the data and mindful of (mis)interpretation from a research perspective by the research team. The auditor considered the data analysis procedure to be visible, comprehensible and acceptable, and the ensuing description of results to be representative of the data.

2.5 Results

2.5.1 ASPECTS OF RESEARCH

Quality concerns for practice-oriented research as expressed by the teacher-researchers typically pertained to specific aspects of research instead of to research as a whole. Aspects of research that they distinguish are intervention, method and results. For example, when asked to reflect on what they considered important concerning the quality of practice-oriented educational research, the responses of two teacher-researchers pertained to different aspects of research. Daniel, who was developing teaching materials to be used as an intervention in his study, replied:

> '*Teaching materials* have good/desired learning results. The developed teaching materials should be based on a solid theoretical foundation. They add something to existing education, replace or improve it.' (Daniel, reflection, *emphasis added*)

John referred to the results of his study:

> 'The *results* withstand scientific scrutiny. They yield useful insights for teachers and students and contribute to improvement of educational outcomes and teaching methods.' (John, reflection, *emphasis added*)

2.5.2 QUALITY CONCERNS

The teacher-researchers elaborated seven quality concerns for practice-oriented educational research. These concerns form the stipulative definition of the quality of practice-oriented educational research from the teacher-researchers' perspectives. An overview of their quality concerns is displayed in Table 2.4. It should be noted that the order of the quality concerns does not signify the importance of certain criteria over others. Five quality concerns were named after the research-focussed quality concerns as displayed in Table 2.1: 'truth value', 'applicability', 'consistency', 'neutrality' and 'cumulativity'. Although the teacher-researchers did not express exactly the same concerns as discussed in the literature, the intent of their concerns is similar enough to justify the use of the same terminology. The two remaining quality concerns, 'recognisability' and 'effectivity,' did not display significant overlap with the quality concerns from the literature and were named by the research team based on the teacher-researchers' descriptions of their quality concerns.

The teacher-researchers did not create explicit contrast between research-focussed and practice-focussed concerns but combined both perspectives in universal quality concerns that focus on research and practice simultaneously.

Table 2.4. Quality concerns for practice-oriented educational research according to teacher-researchers.

Quality concern	Description
Truth value	Extent to which the results of a study are accurate and in correspondence with empirical reality
Applicability	Extent to which a study, intervention, method and/or result is feasible in and relevant for the context of a study and/or other contexts, in research and/or in educational practice
Consistency	Extent of clarity on the chain of reasoning and effectuation of a research study, and how all aspects of research cohere, so that a study, intervention, method and/or result can be replicated in research and/or practice
Neutrality	Extent to which a study and/or result is independent of the researcher
Cumulativity	Extent to which a study, intervention, method and/or result builds on and contributes to scientific and/or practical knowledge
Recognisability	Extent to which a study, intervention and/or result is in accordance with a teacher's professional experience and expectations
Effectivity	Extent to which a study and/or intervention contributes to educational practice

Truth value

The teacher-researchers stated that results of research should be an accurate representation of occurrences in natural practice settings.

> 'Research should originate in practice and be conducted in practice, but it should be scientifically underpinned (. . .) The analysis should be well substantiated and because of that it becomes possible to write down what the exact effects in practice are.' (Peter, reflection)

According to the teacher-researchers, attention to method is essential to meet this concern, for example by choosing methods that fit with the complexity of real-life classroom settings or by combining quantitative and qualitative methods so that they reinforce each other. Quality concerns pertaining to 'truth value' were mentioned least by the teacher-researchers.

Applicability

Quality concerns relating to 'applicability' were most elaborately discussed by the teacher-researchers. They broke down this concern along two continua, as displayed in Figure 2.1. The first continuum is from applicability in research to applicability in practice.

> 'Research should be relevant for school practice and the world of science. A good study should do these two things simultaneously. If you do research that is only meaningful for schools, that raises the question what makes it relevant for science. But scientific research that is not relevant for schools is also not desirable.' (John, reflection)

The second continuum is from applicability in the context of a study to applicability in other contexts.

> 'Research should be practice-oriented in a sense that it has effect in the practice of study, but it should also yield generalisable results. Generalisable results, because other teachers should also be able to apply it. It is directly practically applicable for people who work in education.' (Leonard, interview)

The teacher-researchers valued applicability along both continua. They stated that a study, intervention, method or result should be feasible in and relevant for other target groups, school subjects and levels of education in both research and practice. For example, the intervention, method and results from a study of in-classroom differentiation in 10th grade biology education using instructional videos should also have relevance for 8th grade English education, in research as well as in practice. An issue strongly emphasised by the teacher-researchers was the potential for the practical use of research, interventions, methods and results in educational practice. They stressed the importance of feasibility with teachers' concerns, knowledge and skill levels, time constraints, and connection with school culture and policy.

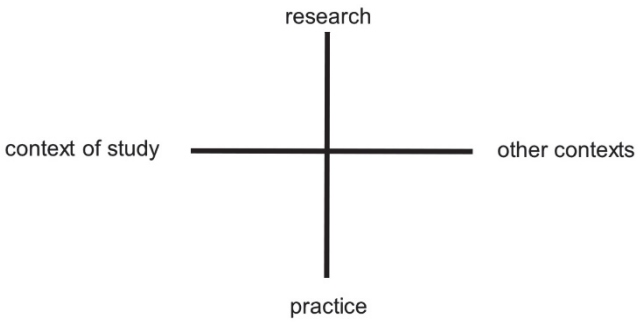

Figure 2.1. Applicability along two continua.

> ‘I try to connect my research to the interests and background of the teachers I work with. That is a condition if you do practice-oriented research, mainly concerning relevance. If you do something that nobody is waiting for than people won’t appreciate it. And concerning background: teachers have to be able to understand it and use it.’ (Leonard, interview)

> ‘Concerning differentiation, it is most important that it is practically feasible for an average teacher with a fulltime job and classes with 25 to 30 students. One of the most important things is that it is a heuristic solution and thus a time saving procedure.’ (Alex, interview)

Compatibility with these issues is an important condition for research to find actual applicability in educational practice instead of remaining as potential applicability. To achieve compatibility with these issues, it is important that a study is grounded in real-life educational practice and that teachers are involved for example in developing and executing an intervention.

Consistency

Consistency was also elaborately discussed by the teacher-researchers. They described it as a two-level concept. First, the chain of reasoning from research question to intervention to method to results and conclusion should be clear, and all elements of a study should be coherent. They also argued that research, intervention, method and results should be meticulously described, both the design and effectuation. The teacher-researchers wanted clarity about what was done exactly, e.g., used methods, used teaching materials and the role of the researcher.

> ‘Research should be trackable. I should be able to see what was done and what the role of the researcher was. It should be systematically trackable.’ (Mark, interview)

> ‘You rarely encounter teaching materials in research, even when the research is on teaching materials. And those results are published and then I wonder (. . .) what actually happened.’ (Oscar, interview)

Second, a study, intervention, method or result should be replicable. According to the teacher-researchers, clarity about the chain of reasoning and effectuation are necessary conditions to achieve this.

> 'In an article, it must be clear what decisions were made and why. The underpinning must be structured in a logical way. That is important for the trustworthiness and to be able to reproduce it.' (Daniel, interview)

The teacher-researchers' perceptions of what should be replicable varied. For example, it was variously argued that the effectuation of an intervention, data analysis, or results should be replicable. There was also diversity in perspectives on the contexts in which a study, intervention, method or result should be replicable: in the same context, similar contexts or other contexts.

Neutrality

Concerning neutrality, the teacher-researchers stated that a study, data analysis and results should be independent of the researcher. However, they perceived obstacles in achieving this neutrality in their own research. They argued that, as teacher-researchers, they have multiple roles in their studies, e.g., as designers, teachers and researchers of an intervention simultaneously. Furthermore, the teachers did their research in their own school, with their own students and colleagues. According to the teacher-researchers, both obstacles could lead to bias.

> 'Neutrality is difficult because I do research in my own school, and because I do the intervention myself but also study that intervention and evaluate it. So, I have all these roles simultaneously. (. . .) It is kind of like marking your own paper, you know? (. . .) And people might also be a little less critical, because they do not want to criticise their colleague. (. . .) These kinds of elements play a role. Well, you could ignore it, but it is simply the case.' (John, interview)

Cumulativity

The teacher-researchers expressed that a practice-oriented study and its research questions should be embedded in educational practice. Practical knowledge should be utilised in the design and effectuation of a study, intervention and method. This practical knowledge can be rooted in the teacher-researchers' personal base of knowledge and experience, or those of their

colleagues. The teacher-researchers also valued scientific knowledge in this respect, but they expressed critical concern about its utility owing to perceived lack of generalisability, the existence of contradictions and the possible impediment of originality.

> ‘In the 20 to 25 years that I am teaching I have heard so many sure theories. (. . .) Look, it is not physics, there are no laws in our education. So, I could say if you do this, chances are this, or if you do that, chances are a little bit bigger, but I can’t say for certain what will happen. (. . .) So, I could say, ’I am going to build on that theory’, but they are basically just frames of reference. You have to really realise that.’ (Alex, interview)

It was also argued by the teacher-researchers that practice-oriented educational research offers opportunities for practical knowledge to become embedded in scientific knowledge, but also for theoretical knowledge to find its way into teachers’ practical knowledge. They stated that the combination of practical and scientific knowledge can elevate the quality of a study, intervention, method or result.

> ‘Colleagues have of course a lot of knowledge and skills because they have been teaching for years, so [they have] a sort of practical knowledge and experience from which they can extract more general statements or characteristics. Those could become a sort of ‘working hypothesis’ if you would formulate them a little more abstractly. Then you start generalising and then you can test whether something indeed is the case. And that way you get higher level knowledge, knowledge that is independent of a specific educational practice. Then it becomes scientific knowledge.’ (Leonard, interview)

Recognisability

According to the teacher-researchers, research should resonate with a teacher’s personal, professional perception of educational practice, students and teaching. It should treat issues that a teacher considers important or difficult to be deemed relevant. Furthermore, it should be possible for a teacher to imagine how an intervention or research result would work in their own educational practice. Unlike the other quality concerns, this concern is centred around an individual

teacher's perspective. All teachers have their individual experiences and expectations, and from this personal frame of reference they consider research. If a teacher recognises a study as being in accordance with their frame of reference, they will be more open to using an intervention or results from research. However, when a study introduces an intervention or result that seems counterintuitive to a teacher's experiences or expectations, they will be more inclined to ignore it.

> 'I pay attention to a lot of things [when reading an article], but what I immediately do, that is kind of a reflex, is to think: Is it practical? How do I do it? How should I do it? How can I use this? Well, furthermore you are constantly comparing with your own, with reality. But that is of course because you are teaching. I am constantly looking: Do I recognise myself in this?' (Alex, interview)

Effectivity

A second quality concern introduced by the teacher-researchers was 'effectivity'. The teacher-researchers emphasised this concern and were very clear about this issue: a practice-oriented educational research study should contribute to educational practice. They argued that a study or intervention should improve educational practice by optimising teaching and learning processes. for example by creating new teaching materials. This should have positive effects on student learning or motivation, or contribute to growing understanding of classroom interaction, teaching or student learning by the teachers involved.

> 'My aim is to reach as many students as possible. My research is the best it can be when this aim is achieved. (. . .) What is good about my research is that it leads to growing insight of myself and my colleagues in teaching and learning, and that it leads to teaching material that improves student learning.' (Oscar, reflection)

2.6 Conclusions, discussion, limitations and implications

2.6.1 CONCLUSIONS AND DISCUSSION

The aim of this study was to identify teachers' perspectives on the quality of practice-oriented educational research and to analyse how these differ from the research perspective. In a qualitative study, teacher-researchers were questioned about their perspectives on the quality of practice-oriented educational research. The results of this study display three notable features of teacher-researchers' perspectives.

First, the teacher-researchers do not explicitly distinguish between research- and practice-focussed quality concerns, in contrast to quality concerns in the literature. From this lack of explicit contrast between research- and practice-focussed quality concerns, it can be contended that the teacher-researchers have similar concerns about quality for research and practice. This seems to reflect the equal importance of the two-sided purpose of practice-oriented educational research, namely, to contribute to educational research and practice. The lack of explicit contrast between research- and practice-focussed concerns could reflect the two-sided perspectives of the informants as both researchers and teachers. However, it could also be an artefact of our data analysis in which we integrated some concerns for research and practice owing to conceptual alignment between concerns for research and practice. This could also explain why some quality concerns occur in our results more often than others. The quality concern 'applicability' occurs most often, possibly because of the broad meaning we assigned to it, owing to conceptual alignment between concerns for applicability in research and practice. On the other hand, the quality concern 'truth value' occurs least, possibly because of the more narrow meaning we assigned to it. 'Truth value' is a strictly research-focussed concern focussed on correspondence with empirical reality which we separated from the more practice-focussed concern for 'recognisability' focussed on teachers' perceived reality, owing to lack of conceptual alignment between the two concerns.

Second, the teacher-researchers tend to focus on different aspects of research instead of only on research as a whole when discussing the quality of research. This differentiation between different aspects of research could result from the teacher-researchers' preoccupation with interventions, methods and results in their own research. Interventions play a central role in the design-based research

studies of the teacher-researchers in which they design and test an intervention. Their focus on interventions might also stem from their perspectives as teachers and their ensuing interest in the content, implementation and effects of an intervention. This aligns with one of the concerns that teachers express about educational research in general. According to teachers, research should indicate how it can be used in educational practice (Gore & Gitlin, 2004; Ratcliffe et al., 2005). Concerns about method might emanate from their perspectives as researchers. From this perspective, they are interested in how a study was executed to assess the quality of research and to acquire ideas on methods for their own research. Concerns about results might originate from both their practice and their research perspectives. The teacher-researchers are concerned about results because they want to know what a practice-oriented educational research study (potentially) contributes to educational research and practice.

Third, seven concerns for the quality of practice-oriented educational research result from our study. These quality concerns overlap with quality concerns expressed by researchers in the literature (Table 2.1), but they also expand, complement and constrain them. The teacher-researchers' quality concerns related to 'truth value' are similar to concerns about this issue in the literature. Both express that results should be an accurate representation of occurrences in natural practice settings. Quality concerns about 'applicability', 'consistency', 'neutrality' and 'cumulativity' are expanded in their meaning. Concerns about 'recognisability' and 'effectivity' are introduced by the teacher-researchers. Concerns about 'comprehensibility', 'acceptability', 'usability', 'value for learning' and 'economic value' as expressed in the literature are either integrated in other quality concerns or are not mentioned by the teacher-researchers.

Expanded concerns

The teacher-researchers' quality concerns about 'applicability', 'consistency', 'neutrality' and 'cumulativity' display similarities as well as differences with researchers' quality concerns in the literature. First, the teacher-researchers' descriptions of 'applicability', 'consistency' and 'cumulativity' are more specific by pointing out which aspects of research should be applicable, consistent and cumulative e.g., intervention, method, result. Additionally, where 'applicability' is described by researchers as the extent of generalisability, the teacher-researchers make this more specific by describing it as feasibility and relevance. Second, they expand the descriptions of 'applicability', 'consistency' and

'cumulativity' by explicitly referring to educational practice in addition to educational research. The teacher-researchers point out that research studies should be applicable and replicable not only in other contexts for research, but also in educational practice so that schools, teachers and students can benefit. Concerning 'cumulativity', the teacher-researchers are convinced of the value of practical knowledge in addition to scientific knowledge. Third, the teacher-researchers' descriptions of their concerns about 'consistency' and 'neutrality' differ from researchers' descriptions. However, these different descriptions are not contradictory but congruous.

Complementary concerns

In the complementary quality concerns introduced by the teacher-researchers, their teacher voices shine through. 'Recognisability' seems to be the practice-focussed variant of the more research-focussed 'truth value'. By addressing this quality concern, the teacher-researchers bring into focus the importance of a teacher's perceived truth in addition to empirical truth. This quality concern aligns with Bartels' (2003) assertion that teachers establish the quality of research on an individual level, in contrast to researchers who establish the quality of research on a community level. This fits with the personal nature of teaching in contrast to the more impersonal nature of research (McIntyre, 2005). It is also in accordance with teachers' concerns about educational research in general, i.e., that research findings should resonate with teachers' professional experience (Everton, Galton & Pell, 2000; Labaree, 2003; Ratcliffe et al., 2005) and apply to their professional contexts (Gore & Gitlin, 2004; Vanderlinde & van Braak, 2010).

In 'effectivity', the teacher-researchers' teacher voices shine through in their focus on (the potential for) change in educational practice. The teacher-researchers want to see the effects of research in the context of a study. Absence of these effects seems to mark research as infeasible for and irrelevant to their own educational practice. In this respect, 'effectivity' can be considered a prerequisite for concerns related to applicability in educational practice.

The introduction of 'recognisability' as a quality concern highlights the importance of teachers' individual frames of reference in assessing the quality of practice-oriented educational research. This may explain why teachers are hesitant to use research and its results. As already established, teachers and researchers have differing reference frames and view research from differing perspectives (e.g., Hammersley & Gomm, 2002; Bartels, 2003; Ratcliffe et al., 2005; Joram, 2007).

It is plausible that this creates a mismatch between the way that educational practice is portrayed by educational researchers and the way that it is perceived by teachers. This may lead teachers to ignore research, because people are generally inclined to ignore information that does not fit with their preconceived notions and frames of reference (Kahneman, 2011).

Quality concerns related to effectivity provide another explanation for the limited use of research and its results by teachers. For teachers, the effects of implementing an intervention or result from research in their educational practice should be in proportion with the required effort (Doyle & Ponder, 1977). This implies that research should display sufficient effectivity for teachers to consider making an effort to use it in educational practice.

Constrained concerns

Researchers' practice-focussed quality concerns do not emerge as separate concerns in the teacher-researchers' perspectives. Concerns about 'comprehensibility', 'acceptability', 'usability' and 'value for learning' are partly integrated into teachers-researchers' concerns about 'applicability', 'recognisability' and 'effectivity'. Concerns on 'economic value' were not addressed and are therefore considered beyond the scope of the teacher-researchers' concerns.

2.6.2 LIMITATIONS

The established stipulative definition of quality concerns for practice-oriented educational research is based on teacher-researchers' perceptions. The respondents in this study were in rather distinctive positions as teachers in secondary education while simultaneously holding a postdoctoral research position at a university. It is assumed that the respondents' perceptions of quality of practice-oriented educational research are based on their experiences as both researchers and teachers. However, it is unknown whether these perceptions are in accordance with the perceptions of teachers without research experience or in other sectors of education. Additionally, the stipulative definition does not provide directives on how to address quality concerns in practice-oriented educational research studies. These issues remain for further research.

2.6.3 IMPLICATIONS

The used informed grounded theory approach (Thornberg, 2012) was a good fit for this study. Given the topic, a classic grounded theory study purely based on

inductive reasoning would not be possible since we as educational researchers already had knowledge of and ideas about quality concerns for (practice-oriented) educational research. We also considered it undesirable to ignore existing knowledge and theories present in the literature. The informed grounded theory approach as established by Thornberg (2012) provided the opportunity to use pre-existing ideas and theories in a non-constraining way by complementing inductive analysis with abductive reasoning inspired by this pre-existing knowledge. This resulted in a new theory grounded in the data without ignoring extant knowledge and without imposing predefined categories on the data. Since this approach is rooted in constructivist grounded theory, it should be recognised that the codes and categories used in the data-analysis and the resulting grounded theory did not emerge from the data, but are the product of deliberate interpretation by the researchers (Charmaz, 2014).

The stipulative definition of quality for practice-oriented educational research from teacher-researchers' perspectives identified in this empirical study differs from researchers' stipulative definition based on the educational research literature. Even though the differences are small, they are meaningful. Nevertheless, it can be argued that, instead of emphasising these differences, the emphasis should be on researchers' and teachers' common concerns. By emphasising their common quality concerns, researchers and teachers can work together to address the challenges of legitimacy and relevance faced by research in practice. In addition, it can be argued that their different definitions reflect the substantial differences between research and teaching. Labaree (2003) argues that it should not be attempted to eliminate the differences between teachers' and researchers' perspectives. Moreover, they can easily coexist since they do not exclude each other, and as long as neither of them claims legitimacy over the other (Wardekker, 2000; Hammersley, 2007). Considering both arguments, we suggest that teachers should become more involved in research. So far, teachers are already included in, for example, discussions on which research topics to address or in development and execution of interventions. We suggest involving them in more substantive ways by also including them in the development of research proposals, in decision making on research funding and in the execution of research projects. Taking their common quality concerns as a starting point, close collaboration between both stakeholders provides teachers with the opportunity to voice their divergent concerns. It simultaneously provides researchers with the opportunity to address teachers' concerns in all phases of a research project.

This could decrease researchers' challenges concerning legitimacy and relevance of their work and increase teachers' use of research in educational practice, resulting in a more evidence-based educational practice.

As established by Verschuren (2009, p. 13), sceptics of practice-oriented research 'believe that criteria for practice-oriented research are easier to fulfil than those for theory-oriented research. However, [. . .] the opposite is true; it must fulfil more and more complex criteria than theory-oriented research'. The quality concerns based on the two-sided research and practice perspective of teacher-researchers are more complex than the quality concerns based on the research perspective in the educational literature. This study highlights how the inclusion of teachers' individual frames of reference in the stipulative definition makes addressing these quality concerns more complex. In particular, addressing quality concerns about 'recognisability' provides a serious challenge for practice-oriented educational researchers. The personal character of this quality concern means that there is no guarantee that teachers will use a research study and its results, even if the other quality concerns are met. This is not a flaw on behalf of teachers or of the stipulative definition; it emphasises the subjective nature of quality and the importance of teachers' professional judgement.

3. TOWARDS A SHARED UNDERSTANDING OF THE IMPACT OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH: SCOPE, NATURE AND PROGRESS

ABSTRACT
Practice-oriented educational research is renowned for its impact, both in educational practice and research. Yet, existing studies on the impact of practice-oriented educational research reflect a proliferation of ideas on what impact is, can or should be. The aim of this study is to contribute to a shared understanding by establishing a conceptualisation of the impact of practice-oriented educational research. Based on current literature, a tentative conceptualisation in the dimensions scope, nature and progress, representing the who, what and when of change, is proposed. The tenability and completeness of this conceptualisation is subsequently investigated in a qualitative study into the impact of ten purposefully selected practice-oriented educational research studies. The results complement the proposed conceptualisation and establish its empirical tenability. The proposed conceptualisation of impact of practice-oriented educational research in terms of scope, nature and progress can facilitate and focus discussions, considerations and analyses of the impact of practice-oriented educational research.

KEYWORDS
Impact; practice-oriented educational research; educational practice; educational research; teacher research

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3.1 Introduction

Practice-oriented educational research is renowned for its supposed impact in educational practice. Practice-oriented educational research is scientific research that is characterised by emanating from an issue in educational practice, being conducted in practice with the collaborative involvement of relevant stakeholders (i.e., researchers and teachers), and building on and aiming to contribute to both educational research and practice. Practice-oriented educational research is increasingly popular, as evidenced by the high share of practice-oriented educational research articles in scientific journals of education (Ertl, Zierer, Philips, & Tippelt, 2015). However, there is limited empirical research on, and hence limited empirical evidence, to support the notion of impact of practice-oriented educational research in educational practice (cf. Levin, 2013). Most studies concerning impact focus on connections between educational research and practice (e.g., Huberman, 1994; Kennedy, 1997; Levin, 2013; Farley-Ripple, May, Karpyn, Tilley, & McDonough, 2018) or how research can contribute to educational practice (e.g., Weiss, 1979; Dagenais, Lysenko, Abrami, Bernard, Ramde, & Janosz, 2012). Existing studies that do focus on the impact of practice-oriented educational research mainly address research conducted by teacher-researchers and consistently emphasise impact on the teacher-researchers themselves (e.g., Henson, 2001; Campbell & Jacques, 2004; Snoek & Moens, 2011; Bakx, Bakker, Koopman, & Beijaard, 2016; Hilton & Hilton, 2017; Dunn, Hattie, & Bowles, 2018). Impact on broader contexts in educational practice and research remains largely unknown. In addition, discussions on impact tend to become increasingly focussed on ‘what works’, turning impact into a narrow instrumental concept. However, as convincingly argued by Biesta (2007, 2010), a broader interpretation of the contribution of educational research to educational practice and research is desirable. Such a broader interpretation should synthesise the proliferation of ideas on what impact is, can or should be currently reflected in the literature.

The aim of this study is to contribute to a shared understanding of the impact of practice-oriented educational research. A shared understanding of the impact of practice-oriented educational research facilitates discussions, considerations and analyses of the impact of practice-oriented educational research studies, both by researchers and practitioners. In the next section, synthesising available literature, a tentative definition and conceptualisation of the impact of practice-

oriented educational research are proposed. Subsequently, inspired by the idea of a 'proof-of-concept', the tentative conceptualisation is empirically substantiated in a qualitative study on the impact of purposefully selected practice-oriented educational research studies to establish its tenability and completeness. We should note that this elaboration focusses on the impact of specific practice-oriented educational research studies and not the impact of practice-oriented educational research in general (i.e., as a research approach, cf. Brown, 2005).

3.2 Definition and conceptualisation of impact of practice-oriented educational research

3.2.1 DEFINITION OF IMPACT

Impact, also referred to as research use or educational change, is variously described in the literature as 'the varied and unpredictable ways that research changes the way people think, how they understand, explore and reflect on their life-worlds' (Saunders, 2011, p. 16), 'when research, in any of its multiple forms, makes a difference to subsequent actions that people take or refrain from taking' (Levin, 2004, p. 2), and 'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.' (Higher Education Funding Council England, 2011, p. 48). From these descriptions of impact, we conclude that 'change' is a central characteristic of impact. Additionally, it is widely acknowledged that most impact does not occur in a direct manner, but in an indirect one (e.g., Weiss, 1979; Bates, 2002; Burkhardt & Schoenfeld, 2003; Gardner, 2011; Dagenais et al., 2012; Cain & Allen, 2017) and can therefore take time to occur. Furthermore, research by Vulliamy and Webb (1992) shows that two aspects can induce impact, namely the product and process of research. Reflecting these notions and taking into account the characteristic twofold aim of practice-oriented educational research, we tentatively define impact of practice-oriented educational research as every change in educational practice or research that occurs at some point in time, whether or not intended, from the product or process of a practice-oriented educational research study.

In a conceptualisation of the scale of educational reform, Coburn (2003) proposes four interrelated dimensions, namely the spread, depth, sustainability and ownership of reform. Inspired by these dimensions of reform by Coburn and taking into account discussions on the impact of practice-oriented educational

research in the literature, impact is tentatively conceptualised in three dimensions: scope, nature and progress, representing the who, what and when of change.

Below, the three dimensions are theoretically elaborated based on conceptual and empirical studies on impact and use of practice-oriented educational research, whether or not conducted by teacher-researchers, and studies on educational change.

3.2.2 SCOPE

The first dimension of impact is scope, identifying the targets of change (i.e., the who). Following from the dual purpose of practice-oriented educational research, the scope of impact includes educational practice and educational research. This aligns with Zwart, Smit and Admiraal (2015) who in their review study of teacher research include impact on school development and the scientific knowledge base.

Pertaining to scope, Frost and Durrant (2002) differentiate between impact within the school of a teacher-researcher and impact beyond the school. Impact within the school is focussed on individuals (i.e., teachers and students) and the school as an organisation. Impact beyond the school, on the contrary, is focussed on more abstract targets, such as public debate, transfer of professional knowledge and contributions to social capital. Two subdimensions of scope can be identified from this. First, impact can be in or beyond the context of research. Second, impact can be on individuals (i.e., teachers, students), a community (i.e., school) or society (i.e., public debate, social capital). Building on these ideas, we conceptualise the scope of impact as consisting of individuals and communities in the context of research or other contexts, both in educational practice and research, and on the fields of educational practice and research in general.

Illustrative of this conceptualisation of scope in educational practice is a study by Vrijnsen-de Corte, den Brok, Kamp and Bergen (2013) which shows that practice-oriented educational research conducted by teacher-researchers can contribute to impact on individual levels, such as improved student learning and achievement and increased professional development and motivation of teachers and ensuing changes in their teaching practice, and to impact on community levels, by changing the culture and enhancing educational development within a school. Additionally, Zwart et al. (2015) found that impact objectives for practice-

oriented educational research conducted by teacher-researchers mainly focussed on changes in the practice context of study, such as the teacher-researchers' professional development and changes in their educational practice and schools (Zwart et al., 2015). Impact in other practice contexts can also occur, for example when teacher-researchers present their research at conferences or write research reports to share their results with practitioners from other schools (Meijer, Oolbekkink, Meirink & Lockhorst, 2013).

Concerning impact on educational research, several studies indicate that practice-oriented educational research could contribute to educational research by adding new knowledge to the scientific knowledge base. Sometimes this succeeds (e.g., Admiraal, Buijs, Claessens, Honing & Kardijk, 2017), at other times it remains an intention (e.g., Meijer et al., 2013; Zwart et al., 2015). Besides impact on the field of educational research, studies by Huberman (1994, 1999) show that individual researchers do not remain unaffected by sustained interaction with practitioners during practice-oriented educational research studies, as it can lead to changes in their conceptions, research interests, methodological approaches and teaching. Similar to educational practice, the field of educational research is composed of individuals and communities. Impact on these individuals and communities could be valuable in itself and provide a plausible and interesting route towards impact on educational research in general. In line with the scope of impact in educational practice, the scope of impact in educational research therefore consists of individuals, communities and the field in general.

3.2.3 NATURE

The second dimension of impact is nature, identifying the kind of change (i.e., the what). In a review on the use of research-based information by school practitioners, Dagenais et al. (2012) discuss three forms of change which they refer to as 'research use' by teachers. Conceptual change implies that research influences teachers' thinking. Cain (2015) specifies that research can affect both the content and way of teachers' thinking. Instrumental change implies that research influences teachers' acting and decision making, leading for example to changes in teaching practice. Symbolic or strategic change, also termed confirmatory (Cain, 2015) or political change (Tseng, 2012), implies new or changed substantiations to maintain pre-existing opinions or practices. As for the latter, no actual changes in thinking or doing occur. Even though the above

studies on the nature of change pertain specifically to teachers, we presume that these kinds of changes can also apply to other individuals or to communities in both educational practice and research. For example, Broadfoot and Nisbet (1981, p. 116) established that 'the impact of research on educational studies is not limited to building up a substantive content to the discipline, but also and more importantly, research influences the style of thinking within these disciplines', implying conceptual changes on individual and community levels in educational research. From this notion, we assert that practice-oriented educational research can just as well contribute to conceptual, instrumental and symbolic changes in individual researchers, communities of researchers and the field of educational research in general.

3.2.4 PROGRESS

The third dimension of impact is progress, identifying the course of change over time (i.e., the when). Coburn (2003) argues that sustaining change over time is key to deep and lasting change. Hilton and Hilton (2017) found that teacher research can result in long term change for the teacher-researchers involved, leading to lasting changes in educational practice in their classrooms and in their school, for example by increased collaboration with colleagues, continuing use of data or continuing research activities. Concerning impact beyond the context of research, Gardner (2011) argues that educational research in general mostly does not have an immediate impact but may take many years because 'it needs to be interpreted and mediated in a variety of processes to accommodate different circumstances' (p. 559), both in educational practice and research. We presume that this also applies to practice-oriented educational research. From these notions, two subdimensions of progress are identified: sustainability, referring to how long impact lasts, and timeframe, referring to when impact occurs.

3.3 Research question

To empirically substantiate the proposed conceptualisation of impact of practice-oriented educational research, a qualitative study into the impact of purposefully selected practice-oriented educational research studies conducted by postdoctoral teacher-researchers in the Netherlands, is conducted. The intent of the empirical study is to establish the tenability and completeness of the proposed conceptualisation. Since impact on teacher-researchers themselves has been studied extensively, this study focusses on impact beyond the teacher-researchers. The central research question is:

What scope, nature and progress of impact in educational practice and research do the teacher-researchers describe for their practice-oriented educational research studies?

3.4 Method

In a qualitative study, empirical data on the impact of ten teacher-researchers' practice-oriented educational research studies were analysed deductively and inductively (Miles, Huberman & Saldaña, 2014) simultaneously, meaning that the dimensions and subdimensions of impact as described above were used as predefined codes while maintaining an open view to identify any other (sub)dimensions of impact that could emerge from the data.

3.4.1 CONTEXT

In the Netherlands, practice-oriented educational research is the most commonly used research approach, evident from funding patterns (NRO, 2018) and researchers' self-reported research activities (van Braak & Vanderlinde, 2012). There is also a growing amount of practice-oriented educational research being conducted by teacher-researchers in doctoral and recently also postdoctoral research projects (van Bergen, Groot & van der Wel, 2018). These research projects are largely subsidised by the Dutch Ministry of Education and the Dutch Research Council, because of the expected impact on educational practice, for example on professional development of teachers or quality of education.

As the empirical context for this study, we purposefully selected (Patton, 2002) ten postdoctoral research projects conducted by teacher-researchers. This context was selected based on the expected impact on both educational practice and research. First of all, the research projects were all design-based studies (cf. McKenney & Reeves, 2012; Bakker, 2018), a kind of practice-oriented educational research which explicitly aligns with the twofold aim of practice-oriented educational research to contribute to both educational practice and research. Second, the research proposals for these projects were written by the teacher-researchers in close collaboration with colleagues at school and a university-based supervisor to ensure embeddedness of the research project in educational practice and current educational research. Third, the research was conducted by experienced teacher-researchers who were assumed to be familiar with the needs and procedures of both educational practice and research. They

could use this familiarity with both worlds to increase the impact of their research projects.

The postdoctoral research projects were funded by the Ministry of Education. A programme committee consisting of three professors in the field of (science) education awarded research grants to teacher-researchers based on the quality of their research proposals, including potential for impact. The programme committee assigned the third author to organise bimonthly meetings for the postdoctoral teacher-researchers for purposes of peer support. At these meetings, they shared experiences concerning their distinctive dual positions as teachers and researchers, and discussed the content and advancement of their research studies.

3.4.2 RESPONDENTS

Ten postdoctoral teacher-researchers were selected as respondents. The respondents were teacher-researchers with five to twenty-one years of experience as science or mathematics teachers in secondary education and a

Table 3.1: Overview of teacher-researchers and their research projects.

Teacher-researcher	School subject	Title of postdoc research project
Anna	Chemistry	Interrelatedness of context-based chemistry education and student needs
Alex	Biology	A practical approach to within classroom differentiation using video's
Daniel	Mathematics	Differentiation according to students' interest in mathematics education
John	Biology	Influence of knowledge on neurological processes on teachers' classroom practice
Leonard	Physics	Multidisciplinary contexts for flexible use of concepts
Mark	Biology	Professional development in a teacher development team focused on design, use and evaluation of context-concept education
Mike	Biology	Use of data to enhance teachers' teaching practices
Oscar	Physics	Modelling in physics education
Peter	Physics	Technical internships to enhance students' motivation for science
Tessa	Chemistry	Enhancing language proficiency of grade 10 students in science education

doctoral degree in either science, mathematics, or science or mathematics education. The teacher-researchers received a grant to conduct a practice-oriented educational research study for two days a week for two or three years while maintaining their teaching positions in secondary education. Table 3.1 provides an overview of the teacher-researchers and the titles of their research projects. The teacher-researchers conducted their research in their own schools with the support of a university-based supervisor. They all had a secondment at a university for the duration of their research project.

3.4.3 DATA COLLECTION

Data were collected using two individual interviews, individual reflections, and small group discussions, leading to method triangulation (Miles & Huberman, 1994). Multiple methods of data collection were used to provide a variety of opportunities for the respondents to consider the impact of their research. Since the teacher-researchers' studies were ongoing at the time of this study, it was expected that the teacher-researchers had clear ideas about the aspired impact of their studies and that this aspired impact might have been partially achieved already. Both aspired and achieved impact were therefore included.

At the start of the teacher-researchers' research projects, the first individual semi-structured interview was conducted. The teacher-researchers were asked about the goals of their research project, for example: What do you want to achieve with your research project? For yourself? For the school? For the university? When would you be satisfied with your research project? The interviews were recorded and transcribed.

In the middle of the second year, the teacher-researchers were asked to write an individual reflection on the impact of their research project. They received an empty matrix in which they could write down their aspired and achieved impact in educational practice and research. These reflections were held at one of the teacher-researchers' bimonthly meetings. After writing down their individual reflections, the teacher-researchers engaged in small group discussions with two or three teacher-researchers to discuss differences and similarities in their aspired and achieved impact. The individual reflections were collected, and the small group discussions were recorded and summarised.

At the end of the second year, a second individual semi-structured interview was held with each teacher-researcher. They were again asked about the aspired and

achieved impact of their research, for example: What is most important for you to achieve with your research? Are there any other things you would like to achieve? Are there any unplanned or unforeseen achievements of your research? The teacher-researchers were also asked to elaborate on the statements in their individual reflections, for example: What do you mean by this impact in educational practice? Why do you want to achieve this impact on educational research? To ensure overall coverage of the dimensions scope, nature and progress of impact and their subdimensions, an overview of the (sub)dimensions of impact was presented to the teacher-researcher at the end of the interview to initiate discussion of (sub)dimensions of impact not addressed so far. The interviews were recorded and transcribed.

3.4.4 DATA ANALYSIS

Data were analysed using a qualitative content analysis strategy (Schreier, 2013). First, a coding scheme was developed with the dimensions scope, nature and progress of impact and their subdimensions as described in the theoretical elaboration as categories and subcategories. Subsequently, descriptions of all categories and subcategories, examples and decision rules were added to the coding scheme.

Table 3.2: Example of quotation, summarising descriptive statement and coding.

Quotation	Summarising descriptive statement	Coding
Q: What do you hope your research will yield for your school? A: Well, the wish to teach in a more differentiated manner is substantive, for everyone, but almost nobody actually succeeds at it. It would be really nice if we could achieve something, like say 10% of all lessons, or 20%, are taught in that way. Look, you should never do something for 100%. But that everyone has some guiding principles to teach in a differentiated manner. (Alex, interview I)	Alex wants all teachers at his school to get guiding principles to teach in a differentiated manner, so that they can change 10% to 20% of their lessons to more differentiated education.	SCOPE = practice Context = of research study Target = individuals → teachers NATURE = Conceptual, cognitive Instrumental PROGRESS = /

Second, all quotations containing information on aspired and achieved impact and pertaining to any of the (sub)categories in the coding scheme were selected, summarised in a descriptive statement and coded. An example of this is presented in Table 3.2. During this process of deductive coding, we maintained an open view to identify any new (sub)dimensions of impact that could emerge from the data. The predefined coding scheme was adapted following the identification of new subdimensions of nature and progress of impact.

The third step was data condensation. All quotations with the same codes were merged and summarised in descriptive statements of impact. An overview matrix (Miles, Huberman & Saldaña, 2014) containing the descriptive statements pertaining to each dimension of impact was created for each teacher-researcher. In a last step, all overview matrices were checked against the adapted coding scheme to ensure all data fitted the coding scheme. All data fitted the coding scheme and the overview of dimensions and subdimensions of impact was therefore considered complete.

Quality of the data analysis was checked using an audit procedure as described by Akkerman, Admiraal, Brekelmans and Oost (2006) and extended by de Kleijn and van Leeuwen (2018). A peer researcher not involved in the study performed a summative audit. The auditor considered the data analysis procedure to be visible, comprehensible and acceptable, and the ensuing description of results to correspond with the data.

3.5 Results

The results are presented as an empirical substantiation of the proposed conceptualisation of impact of practice-oriented educational research in the dimensions scope, nature and progress. In the following section, all discussions of impact could concern aspired or achieved impact as both kinds of impact were included in our data collection and analysis. As it is irrelevant for the aim of this study whether impact was aspired or actually achieved, and for purposes of readability, we refrain from explicating this throughout the text.

3.5.1 SCOPE

All teacher-researchers discuss impact on both educational practice and research. They refer to impact on individuals (e.g., students, teachers, researchers), communities (e.g., physics team, school, research group) and on more abstract targets in educational practice and research in general (e.g., policy,

knowledge base). The individuals and communities as targets of change can be located in the context of study or beyond. Typically, impact on individuals and communities in their own school and on the field of educational research by adding to the scientific knowledge base are discussed most elaborately. However, the teacher-researchers also discuss impact in educational practice beyond their own school and in general, and on individuals and communities in educational research. Exemplary quotations to illustrate impact for different targets of change are presented in Table 3.3.

Concerning impact in educational practice, the teacher-researchers mostly leave implicit whether they are referring to impact in their own school or in other educational contexts, as illustrated by Alex' quotation (Table 3.3, Q4) on how he wants 'to develop a procedure that teachers can use.' Teacher-researchers that do explicitly discuss impact in educational practice beyond their own school indicate similar impact in both contexts.

The teacher-researchers discuss impact in educational practice and research resulting from both process and product of their research. Concerning process, for example, Oscar (Table 3.3, Q8) states that him doing research generates opportunities for mutual observation and collaboration in the physics team at his school, and Mark (Table 3.3, Q13) indicates that through his presence in the university research group, he is able to share experiences as a teacher. Concerning product of research, for example, Anna (Table 3.3, Q10) discusses how she wants teachers to use the results of her study to support students' development of higher order thinking skills, and Alex (Table 3.3, Q7) thinks that his supervisors can use the results of his study to continue research on his topic.

As discussed, the teacher-researchers typically pursue impact in educational practice and research. The following quotation from Leonard illustrates that, in his perspective, these can be pursued simultaneously:

'A framework [on interdisciplinarity] as a scientific outcome, but also practical for teachers, for education for students in which they can see that science subjects are interrelated, for a new way of working within the school. Those are really the most important things.' (Leonard, interview 2)

Table 3.3: Overview of teacher-researchers' exemplary quotations to illustrate scope and nature of impact of practice-oriented educational research.

	EDUCATIONAL PRACTICE		**EDUCATIONAL RESEARCH**		
	WITHIN CONTEXT OF STUDY OR BEYOND				
	INDIVIDUALS				
	conceptual change	**instrumental change**	**conceptual change**		**instrumental change**
Q1	*Cognitive and affective change:* 'Well, multiple things. So, they [students] should be able to see that there are real-world problems for which you need different techniques and subject knowledge to solve them. Often students find those real problems interesting. So that is one thing, their motivation. But also, that they become more able to flexibly use their monodisciplinary subject knowledge. So, suppose that they learn something in chemistry and then suddenly they have to apply that in a very different way in biology, again, in a different context. If they can do that, I think their	Q3 'I set the goal for myself to get as many students as possible to go to a technical university. That is my goal. So with this research I want to figure out if we are on the right path to achieve that. So not just following those educational innovations that are proposed on a national level, but doing what is right to achieve that goal.' (Anna, group discussion)	Q5	*Cognitive change:* 'What I think is valuable, is that I am working at school and at the university. I think that some university researchers should stand in front of a classroom some time. That would be a whole experience for them, because I really think they miss that experience. I think I can communicate that practice experience to them. I think that can be really valuable for people who work at the university.' (Anna, interview 1)	Q7 'The most important issue is that the research question is answered so that they [supervisors] can continue research on this topic.' (Alex, interview 1)

	understanding becomes more flexible.' (Leonard, interview 2)						
Q2	*Affective change:* 'Well, they [colleague teachers] are more interested in the approach in my teaching materials and the impact of my teaching materials than in my research. They are less interested in that, but more in things like differentiation according to interest and letting students make choices and the effects of that et cetera.' (Daniel, interview 2)	Q4	'The most important thing that I want to achieve is to develop a procedure that teachers can use for differentiated instruction over a longer period of time while maintaining grip and control.' (Alex, interview 2)	Q6	*Cognitive change:* 'Well, he [university-based supervisor] does not know so much about language, so for him there is also [something to learn]: the relationship between language and natural sciences.' (Tessa, interview 1)		

COMMUNITIES							
	conceptual change		**instrumental change**		**conceptual change**		**instrumental change**
Q8	*Cognitive and affective change:* 'There now is someone who has the time to walk around in the school. I can take a look into their classrooms more often. I learned a lot from that, but	Q10	'What I would like is that higher order thinking. […] Teachers should support that by asking questions in a structured way, because students can't do that on their own. […] Higher order thinking	Q13	*Cognitive change:* 'When I am here [at the university] in this scientific community, and we have a research team that meets about once a month, I notice that I can share a lot from my	Q15	'One impact is that there is more attention for language in the teacher training program. I discussed this with my supervisor and he added language exercises to the

	they did as well, from observing. […] I observed other [physics] teachers, but they could also learn from that because we had discussions about it. How do you do something? Why do you do it that way? What are pros and cons? […] You should ask them, but I am certain that we all gained from it. And what stands out is that we now have a team in which everybody finds that the collaboration and atmosphere are great. I don't think that is because of my person, but I think that is because of the fact one of us has the freedom to go to the others, to observe, to collaborate.' (Oscar, interview 1)		needs to be well implemented for students […] and that needs to be done by teachers. That is what I really want to achieve and what I want to become part of the regular curriculum.' (Anna, group discussion)		experiences in practice. Because I notice that people here [at the university], they kind of have an idea about students and what happens in a school, but the atmosphere in a school and how hard it is to change something for example, well, they often don't have a good image of that. Then I can bring in nuances or explanations. So, it is valuable to share here [at the university] what I encounter at school and what I encounter as a teacher in my classroom for example' (Mark, interview 1)		classes for new teachers.' (Tessa, interview 2)
Q9	*Affective change:* 'I want to initiate a culture of learning in my school. That they understand that change does not occur in one leap, but that it happens in small steps. That requires a long-term	Q11	'In the school's mission statement, they state five principles. Well, if you want your education to connect to the development of the brain, which is one of the principles, you need	Q14	*Cognitive change:* 'At the university they really want to know how teacher development teams work, how they do and do not work. They want to use that knowledge to study other	Q16	'I know that different people [in my research group] are doing different things with interdisciplinarity and I talk to them of course. And well, it could become more of a research

	vision from the school.' (Mike, interview 1)		knowledge about that. But knowledge, how to do that, is minimally present. So that is what I studied so I can say which are relevant points and what that means for the school's policy and other school things, like what course materials or methods to purchase. So that informed decisions can be made.' (John, interview 2) 'My intended impact is to improve the set-up of the internships, mainly by increasing the role of parents. Then we want the results […] to be tested in other schools and in other regions.' (Peter, group discussion)		teacher development teams, both the success factors and the methodological aspects, like how to study the development of teachers.' (Mark, interview 1)		theme, so that these [different things] can reinforce each other.' (Leonard, interview 2)
		Q12					

BEYOND CONTEXT OF STUDY

EDUCATIONAL PRACTICE IN GENERAL				**EDUCATIONAL RESEARCH IN GENERAL**			
conceptual change		**instrumental change**		**conceptual change**		**instrumental change**	
Q17	*Cognitive change:* 'I think in general, schools, on a large scale, just do all kinds of things without being able to give substantive arguments	Q18	'It would be really nice, not that it is going to happen, if it would be expanded to the whole Netherlands so that all students in grade 8 or 9	Q19	*Cognitive change:* 'My idea was to somehow scientifically prove that responding to students' interest will improve their motivation and effort. So,	Q20	'What could it yield? […] That you should not just change so many things at the same time in giant leaps. […] Science should learn that you

	for them. […] I hope I can contribute to [change] that.' (John, interview 1)	students would do a business, social and technical internship.' (Peter, interview 2)	if I can prove that, I've achieved something nice. And that by focussing their [students'] attention on how they can use mathematics in other disciplines, that you can improve their image of mathematics. And that you can integrate that in teaching materials. That is basically what I want to prove. […] If I look at the literature, I find some things on differentiation based on interest, but it is not the main focus. Differentiation is mostly based on ability levels, not students' interest.' (Daniel, interview 2)	should not make drastic, big and many changes. Then at some point you have no idea anymore what you are changing and what effects it has. And before it [an educational innovation] is studied, it is already implemented. Maybe science should learn that it should be the other way around. That you should first know what you are doing before you implement it.' (Anna, interview 1)

3.5.2 NATURE

The teacher-researchers address conceptual and instrumental change in educational practice and research on individual, community and field levels. The teacher-researchers do not address any symbolic change in educational practice or research beyond themselves [2]. Exemplary quotations of the teacher-researchers on conceptual and instrumental change at all levels in educational practice and research are presented in Table 3.3.

Conceptual change

Conceptual change refers to changes in the content and way of thinking on individual, community or field levels in educational practice or research. From the teacher-researchers' discussions of impact, two distinctive natures of conceptual change can be discerned, elaborating the tentative conceptualisation based on the literature. Conceptual changes can be both cognitive and affective in nature. Concerning conceptual change in educational practice, the teacher-researchers discuss cognitive and affective changes for individuals and communities. On an individual level, cognitive changes can be increased knowledge or understanding for students, for example concerning language usage in science education, application of mathematics in various disciplines or career opportunities in the technical domain, or professional development for teachers, for example concerning use of videos to support student learning or use of data and inquiry to improve classroom practice. On a community level, cognitive changes can be the development of a more long-term vision on educational change within a school. Affective changes can be changes in students' motivation or development of teachers' interest in a certain topic, such as in differentiation according to students' interest (Table 3.3, Q2). On a community level, affective changes can be an enhanced atmosphere within a teacher team (Table 3.3, Q8), increasing sense of community among teachers or a growing culture of learning within a school (Table 3.3, Q9). Leonard's quotation (Table 3.3, Q1) illustrates how he

[2] One of the teacher-researchers describes symbolic change in his own classroom practice. He uses his research project to justify use of a pre-existing educational activity. Hence, there is no actual change, only new arguments to justify an existing practice. Since this concerns symbolic change of (the practice of) the teacher-researcher himself, this is not included in the results of this study.

simultaneously aspires to an affective change (i.e., motivation), and a cognitive change (i.e., flexible use of monodisciplinary subject knowledge), for his students.

Concerning conceptual change in educational research, the teacher-researchers only address cognitive conceptual changes. On an individual level, this can be changes in researchers' knowledge on the teacher-researchers' research topic, such as multidisciplinary science education or interrelatedness between students' language proficiency and achievements in science education. There can also be changes in understanding of educational practice and how research can contribute to changes in educational practice, both on the level of individual researchers and on the community level of a research group.

Concerning conceptual change in the fields of educational practice and research in general, the teacher-researchers aspire to contribute to the practical and scientific knowledge bases. For example, John aspires change in the way schools substantiate educational reform (Table 3.3, Q17), and Daniel sets out to add knowledge on differentiation according to students' interest to existing knowledge on differentiation according to ability levels (Table 3.3, Q19).

Instrumental change

Instrumental change refers to changes in skills, actions, decisions or achievements. The teacher-researchers have clear ideas for instrumental changes at all levels in educational research and practice. On an individual level in educational practice, they aspire, for example, to improve students' language skills, to increase their learning outcomes and achievements, or to change their study choice (Table 3.3, Q3). For individual teachers, the teacher-researchers aspire changes in their classroom practice, such as use of differentiated instruction (Table 3.3, Q4) or use of appropriate feedback strategies towards students, and changes in how they prepare for classroom practice, such as designing and evaluating new educational activities, discussing classroom practice with peer teachers, or collaborating with other teachers to improve educational practice. On a community level, the teacher-researchers discuss, for example, increases in collaboration within teacher teams, changes in curriculum (Table 3.3, Q10) and contributions to school policy and decision making (Table 3.3, Q11).

Concerning instrumental changes in educational research, the teacher-researchers address, for example, that university-based researchers can have

increased interaction with educational practice and that they can use the results of the teacher-researchers' research for future research (Table 3.3, Q7). On a community level, the teacher-researchers think that their research can contribute to the research group, for example, by contributing to the set-up of a new research theme (Table 3.3, Q16) or by contributing to changes in a teacher education program provided by the research group (Table 3.3, Q15).

Instrumental changes on the field levels of educational practice and research in general are focussed on changes in policy, such as the nationwide introduction of internships for students in secondary education (Table 3.3, Q18) or reconsiderations of how educational changes are implemented (Table 3.3, Q20).

3.5.3 PROGRESS

Progress is the dimension of impact least discussed by the teacher-researchers, but they do discuss a subdimension not explicitly discerned from the literature. In addition to sustainability and timeframe, they address the stability of impact, referring to the potential shift of impact over time. Exemplary quotations from the teacher-researchers on progress of impact are presented in Table 3.4.

Sustainability

Ideas on the sustainability of the impact of their research vary among teacher-researchers. Quotations from Alex (Table 3.4, Q21) and Mike (Table 3.4, Q22) illustrate how the former believes that his impact is sustainable while the latter is less convinced of the sustainability and feels that action on behalf of the school management is needed to sustain impact beyond the duration of his research.

Timeframe

Teacher-researchers' discussions of progress mainly relate to impact in educational practice. Only Tessa addresses timeframe in relation to educational research. She discusses how impact in educational practice can occur sooner than impact in educational research (Table 3.4, Q23). The teacher-researchers differ in their views on when impact in educational practice can start, for example at the start of the research project or later when results are available (Table 3.4, Q25). Furthermore, ideas differ on when the full aspired impact can be realised. For example, Alex believes that it will take some years for the results of his research to become embedded in the whole school (Table 3.4, Q24), while impact in Tessa's school is expanding sooner than expected (Table 3.4, Q26).

Table 3.4: Overview of teacher-researchers' exemplary quotations to illustrate progress of impact of practice-oriented educational research.

	SUSTAINABILITY		TIMEFRAME		STABILITY
Q21	'I expect it to be sustainable. […] They [teachers] have to name advantages and disadvantages of all steps of regular and differentiated teaching. The disadvantages of regular teaching are of course the motivators to do this [participate in intervention]. The advantages of differentiated teaching actually occur and the disadvantages are less than expected. [..] I already notice, and that is nice to see, that some colleagues become reluctant to teach in a regular way, old-fashioned lessons.' (Alex, interview 2)	Q23	'I really want it [published] in a good journal. For that you need some more content, you need to have something substantial. And that isn't there yet. You really want data to underpin it. […] That is also why I haven't yet presented my research in the research group. […] For my school it can all be a little less scientific. There you can share sooner, all small steps, compared to the research world. Everybody's time is limited and then I really want to have something to say.' (Tessa, interview 2)	Q27	'Higher order thinking is what we actually want to achieve with this educational innovation, but teachers have to guide that process. […] A sort of scaffolding has to occur in their thinking. Students cannot do that on their own, that needs to be guided. I think that that is where the problem occurs for teachers. They think that students can do that on their own, but they need guidance. I think that teachers need to learn that first.' (Anna, interview 2)
Q22	'I think they [teachers] will remember that they participated in a nice course, you know? And I hope that the management will pay certain attention to use of the outcomes, to use the results in continuing development. […] I had a conversation about this with the school leader last Monday, about his vision for next year.' (Mike, interview 2)	Q24	'What I would like is that it results in a method for differentiated instruction and that it will be successful. […] In addition, I hope that the video's become successful, because I have a strong believe in digitalisation and working with videos. […] So, in a little while, two to three years, we will have a whole new educational set-up [at school].' (Alex, interview 1)	Q28	'What I also noticed is that three teachers from my school [that participated in the teacher development team], start to collaborate more easily on other topics as well. […] They have a sort of common ground and I think that is nice to see. It gives them a feeling of, and sometimes I hear them talk about this, of belonging to a little club that knows something about practical inquiry and that has an

		inquiring attitude.' (Mark, interview 2)
Q25	'I have not presented my research at a conference for chemistry teachers yet, because I do not have results yet.' (Anna, group discussion)	
Q26	'What I didn't expect, and thus didn't plan for, is, well, the expansion to other subjects. Of course, that is something you want, but you never know. That is always hard to predict, in what timeframe that will occur, but it is happening somewhat sooner than I expected.' (Tessa, interview 2)	

3.6 Conclusions, discussion, limitations and future research, and implications

3.6.1 CONCLUSIONS AND DISCUSSION

This study aims to contribute to a shared understanding of the impact of practice-oriented educational research. Following theoretical elaboration, the tenability and completeness of the proposed conceptualisation in the dimensions scope, nature and progress is investigated in an empirical study on the impact of exemplary practice-oriented educational research studies conducted by postdoctoral teacher-researchers. Overall, the results of this empirical study confirm and complement the proposed conceptualisation of impact and show that the conceptualisation of impact in the dimensions scope, nature and progress is empirically tenable.

The impact of the exemplary practice-oriented educational research studies shows that the potential scope of impact of practice-oriented educational research covers individuals and communities in educational practice and educational research, in the context of study or beyond, and the fields of educational practice and research in general. Concerning impact in educational practice, mainly impact in the context of research (i.e., in the context of the teacher-researchers' own schools) is referred to. This is not surprising, considering the research studies originated from issues in the teacher-researchers' educational practices. In general, impact beyond the immediate context of research remains unaddressed. However, similar issues can occur in other educational practices, making (the results of) the studies also relevant beyond the context of research.

Concerning impact in educational research, mainly impact on educational research in general by contributing to the scientific knowledge base is referred to. Again, this is not surprising, considering the high importance that is assigned to publishing in the domain of educational research. Moreover, contributing to the scientific knowledge base is often considered the only possible impact in educational research. However, our results indicate that impact in educational research can also pertain to individuals and communities within this field, potentially leading to valuable changes, such as increased understanding of educational practice and how research can contribute to it among university-based researchers, implementation of research results in teacher education, or

changed research themes in research groups. We want to emphasise that neither we nor the teacher-researchers intend impact on individuals and communities in educational research to compensate for impact on educational practice: it is additional impact that, although usually not considered, is interesting and potentially valuable.

Furthermore, the exemplary practice-oriented educational research studies show impact of a conceptual and instrumental nature. The subdimension conceptual change was complemented by adding a subdivision in cognitive and affective change. Conceptual changes of an affective nature are only discussed for impact in educational practice. This could result from the teacher-researchers' extensive experience in educational practice and more limited experience in educational research, making them more sensitive and articulate concerning changes in practice. It could also result from the different values in both worlds and the more general disposition of educational research to focus on cognition.

Lack of occurrence of symbolic changes in the results could be an artefact of our study, in which we collected data on aspired and achieved impact. This was mainly focussed on actual (conceptual and instrumental) changes in educational practice and research, because that is what is usually aspired. Furthermore, achieved symbolic impact beyond themselves would be difficult for the teacher-researchers to identify because of the characteristic of symbolic changes that there are no actual changes but merely new or changed substantiations for pre-existing conceptions or activities.

Progress of impact is shown to relate to sustainability and timeframe, and stability is introduced as a third subdimension. The impact of the exemplary practice-oriented educational research studies show that impact can last over time (or not), can occur at different moments during or after completion of a study, and that changes can shift over time. Shifts in impact can be intended or move impact beyond aspirations. Stability as a subdimension of progress of impact was explicitly identified in our empirical study. However, in retrospect, potential shifts in impact are also implicitly suggested in the literature. For example, Vrijnsen-de Corte et al. (2013) suggest that teacher research should emphasise impact on teachers' professional development which, in time, can lead to improved student learning and results, and Berger, Boles and Troen (2005) suggest that teacher research can affect school culture, leading to changes in teachers' teaching and subsequent students' learning. Although shifts in impact are thus discussed in

existing studies on impact of practice-oriented educational research, they are rarely conceptualised as such (cf. Engeström, 2011).

The progress of impact in educational research is only discussed to a very limited extent. This could result from the respondents' general inclinations to address impact in educational research less elaborately than impact in educational practice. Since the teacher-researchers mainly discuss impact on the scientific knowledge base, it could also reflect the common assumption that sustainability, timeframe and stability of impact in this area typically follow a standard course over time, for example concerning publication in scientific journals.

Furthermore, there is a generally held belief that practice-oriented educational research should result in different products to achieve impact in both educational practice and research (e.g., McKenney & Reeves, 2012; Akkerman, Bronkhorst, & Zitter, 2013) due to different requirements and values in both worlds and due to differences in aspired impact for both. However, results from our empirical study indicate that, for the teacher-researchers, these might not be as far apart as is often assumed. We assert that it is possible to strive for impact in both worlds simultaneously if the intended impacts align to some extent.

In general, the scope and nature of impact are typically discussed by the teacher-researchers; as already mentioned, progress is discussed considerably less. This could be an artefact of our study in which data collection was mainly centred around questions on aspired and achieved impact, eliciting responses on scope and nature of impact. It could also result from a (perceived) lower urgency of this dimension of impact, because scope and nature (i.e., who and what should change) need to be established first before any statements can be made about progress. However, we contend that the three dimensions of impact are inextricably connected and equally important to address when discussing impact of practice-oriented educational research. Discussions about the scope of impact become meaningless without reference to the nature of impact and vice versa, and discussions of impact with a certain scope and nature loose significance without reference to its progress.

3.6.2 LIMITATIONS AND FUTURE RESEARCH

The empirical study complemented the conceptualisation of impact of practice-oriented educational research. (i.e., added changes of cognitive and affective nature, and stability of progress). However, it remains uncertain whether this

completes the conceptualisation. The analysed exemplary practice-oriented educational research studies were all design-based research studies, a specific kind of practice-oriented educational research. Empirical contexts involving other practice-oriented research approaches, such as action research or lesson study, could yield other elaborations of the dimensions of impact. This could lead to expanded ideas about scope, nature and progress of impact.

In addition, the respondents in our empirical study were postdoctoral teacher-researchers. Since we focussed on impact of practice-oriented educational research, we presumed that it was irrelevant who conducts the research, teacher-researcher or university-based researcher. From our results, we derive that the teacher-researchers were suitable respondents since they provided substantiations for all dimensions of impact and even complemented them by adding new subdimensions. Moreover, they were able to give elaborate insight in the aspired and achieved impact of their research studies in educational practice due to their experience of working within a school, with students and colleague teachers. However, concerning impact on individuals and communities in educational research, they were less articulate. Other non-teacher researchers could provide different interpretations of impact in educational practice and research following from their positions and experiences.

Furthermore, the conceptualisation of impact discussed in this study pertains to practice-oriented educational research. We characterise research following this approach as emanating from an issue in educational practice, being conducted in educational practice with involvement of relevant stakeholders (i.e., researchers and teachers) and building on and aiming to contribute to educational practice and research. Our conceptualisation of impact does not necessarily apply to research following other approaches, such as fundamental or policy-oriented research, because they have other characteristics and inherently other impact objectives and potentials. Future research could show how impact can be conceptualised for other research approaches.

Lastly, both aspired and achieved impact on educational practice and research were taken into account in our data-analysis. Considering the aim and research question of this study, we considered it irrelevant whether impact was actually achieved since ideas on aspired impact could also elaborate the dimensions of impact. A focus on achieved impact in future studies could further substantiate, and potentially elaborate, the proposed conceptualisation.

3.6.3 IMPLICATIONS

At the beginning of this article, we introduced a tentative definition and conceptualisation of the impact of practice-oriented educational research. Based on extant knowledge and an empirical study, an empirically grounded conceptualisation of impact is proposed. A visual representation is presented in Figure 3.1. Following this conceptualisation, the tentative definition of impact can be further specified as change in terms of scope, nature and progress in educational practice or research that occurs, whether or not intended, from the product or process of a practice-oriented educational research study.

The presented conceptualisation adds a broader interpretation of the impact of practice-oriented educational research to existing discussions in the literature, that typically address only one dimension of impact or qualify impact in terms of level or extent (Dagenais et al., 2012). It differs from existing conceptualisations in that it focusses on scope, nature and progress of change in both educational practice and research. It thereby creates the possibility to discuss the impact of a practice-oriented educational research study in a structured and concise way without making any normative or subjective assertions about the level or extent of impact upfront. Furthermore, by separating the who, what and when of change from how to achieve it, this conceptualisation of impact can support practice-oriented educational researchers in establishing the aspired impact of their research without being prescriptive in how to achieve it and consequently imposing impediments on aspired impact. Practice-oriented educational researchers, both teacher-researchers and university-based researchers, can use the conceptualisation of impact presented in this study to ‘imagine the full range of impacts and to plan for them more deliberately’ (Frost & Durrant, 2002, p. 151) over the course of their research studies. Similarly, practitioners can use the presented conceptualisation of impact to identify what impact can be expected or aspired when implementing research findings. The conceptualisation offers an overview of possible directions for impact; it is not a guide that indicates what impact to achieve or prioritise. By supporting practice-oriented educational researchers and practitioners in establishing clear impact objectives, the presented conceptualisation of impact can contribute to achieving impact of practice-oriented educational research in both educational practice and research.

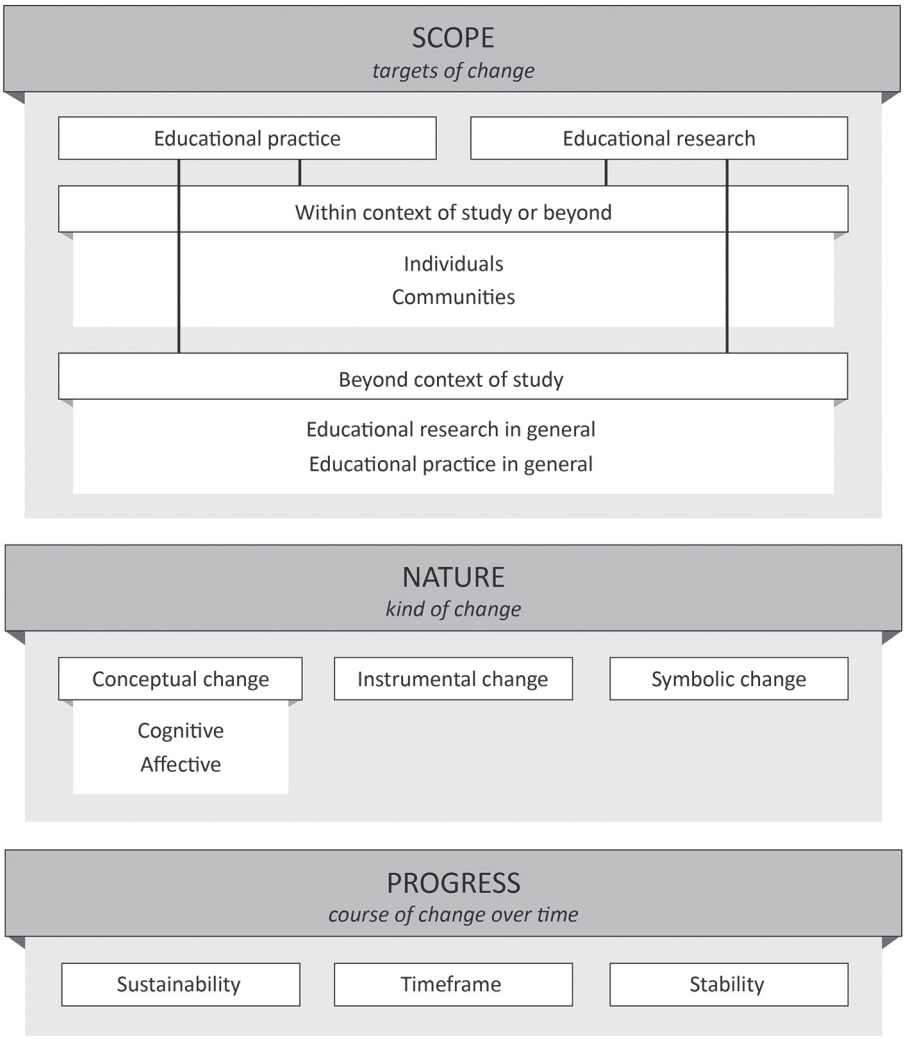

Figure 3.1: Conceptualisation of impact of practice-oriented educational research.

4. DESIGNING FOR IMPACT? IDENTIFYING CHARACTERISTICS OF TEACHER-RESEARCHERS' PRACTICE-ORIENTED EDUCATIONAL RESEARCH STUDIES WITH IMPACT

ABSTRACT

Achieving impact is considered a somewhat puzzling phenomenon, occurring (or not) after the research has been finalised, and influenced by circumstances mostly beyond the study. In contrast, practice-oriented education research seems deliberately designed to foster impact, by studying an issue emanating from educational practice in the 'real' practice context in collaboration with relevant stakeholders, building on and contributing to educational research and practice. This study explores if and how the characteristics of practice-oriented educational research contribute to achieving impact in local school and university contexts. In a qualitative multiple-case study, three purposefully selected teacher-researchers and local stakeholders were interviewed about achieved impact. Findings show that the impact of the studies differed in terms of scope, nature and progress (i.e., the who, what and when of change). Impact in the schools could be related to the research topic and how it was determined, how relevant local stakeholders were involved throughout the study and if findings were reified meaningfully, suggesting that designing for impact is possible.

KEYWORDS

Impact; educational change; practice-oriented educational research; research design; teacher-research

4.1 Introduction

Educational research aims for impact, as is apparent from the 'implications' section of every article. Yet, achieving impact is not straightforward. It is portrayed as a somewhat puzzling phenomenon, occurring (or not) after the research has been finalised, mostly influenced by circumstances beyond the study, such as characteristics of the school organisation and culture, the role of the principal, teachers' beliefs, motivations, expectations and interpretations, issues of dissemination and timing, and the perceived gap between educational research and practice (Gore & Gitlin, 2004; Burkhardt & Schoenfeld, 2003; Berger, Boles, & Troen, 2005; Brown, 2005; Broekkamp & van Hout-Wolters, 2007; Cordingley, 2008; Dagenais, Lysenko, Abrami, Bernard, Ramde, & Janosz, 2012; Oates, 2008; Anwaruddin, 2015; Lee & Seashore Louis, 2019; Liou, Canrinus, & Daly, 2019). Practice-oriented educational research, such as educational design research, action research and lesson study, intends and is expected to contribute to educational practice as well as to educational research. The characteristics of practice-oriented educational research reflect that the design of a study can contribute to achieving impact. These characteristics stress that the topic of research is an issue in educational practice, that the research is conducted in practice, with the collaborative involvement of local stakeholders, and building on and contributing to educational research and practice. Although practice-oriented educational research can be conducted by both university-based researchers and teacher-researchers, especially research studies conducted by teachers can be expected to achieve impact in educational practice and research. Being both researchers and teachers, and therefore having both an insider and outsider perspective on educational practice (cf. Kemmis, 2012), teacher-researchers are expected to be able to conduct scientific research while simultaneously understanding how practice works and speaking 'the language of practice'.

Close examination of existing studies on the impact of practice-oriented educational research conducted by teacher-researchers reveals three issues. First, most studies mainly focus on impact on the teacher-researchers themselves, on their professional development and their classroom practice (e.g., Henson, 2001; Campbell & Jacques, 2004; Snoek & Moens 2011; Colucci-Gray, Das, Gray, Robson, & Spratt, 2013; Bakx, Bakker, Koopman, & Beijaard, 2016; Hilton & Hilton, 2017; Dunn, Hattie, & Bowles, 2018;). Studies about achieved impact beyond the teacher-researchers, in educational practice and research, are

rare, even though it is the twofold objective of practice-oriented educational research. Second, studies that do analyse impact of teacher research in educational practice indicate that there can be an impact on the teaching, learning or culture of a school (e.g., Campbell & Jacques, 2004; Berger, Boles, & Troen, 2005; Meijer, Oolbekkink, Meirink, & Lockhorst, 2013; Vrijnsen-de Corte, den Brok, Kamp, & Bergen, 2013; Oolbekkink-Marchand, van der Steen, & Nijveldt, 2014; Leuverink & Aarts, 2019), but do not explicate what this impact exactly is. They leave unaddressed what changes occur in the teaching, learning and/or culture of schools. Third, although the design characteristics of a study are found to be an important determinant of the use of research-based information by practitioners (Dagenais et al., 2012), it remains unclear how the characteristics of practice-oriented educational research contribute to achieving impact.

In this study, by comparing the achieved impact of three purposefully selected teacher-researchers' practice-oriented educational research studies that differ in how they align with the general characteristics of practice-oriented educational research, we aim to identify how research design characteristics contribute to achieving impact in educational practice and research. The results of this study can indicate how practice-oriented educational researchers and research funders can adequately design studies to achieve impact.

4.2 Impact of practice-oriented educational research

In this section, the characteristics of practice-oriented educational research and how they (are expected to) contribute to achieving impact are elaborated. Furthermore, a conceptual framework for analysing impact of practice-oriented educational research in educational practice and research is outlined.

4.2.1 CHARACTERISTICS OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

Practice-oriented educational research has characteristics that are expected to yield impact in both educational practice and research. The first characteristic is that the research *(1) emanates from an issue in educational practice*. The importance of addressing issues that are relevant and valuable for teachers has been argued extensively (e.g., Doyle & Ponder, 1977; Kennedy, 1997; Everton, Galton, & Pell, 2002; Gore & Gitlin, 2004; Vanderlinde & van Braak, 2010; Farley-Ripple, May, Karpyn, Tilley, & McDonough, 2018;). Moreover, Dagenais et al. (2012) identified practitioners' perceptions of the relevance of a research study

to their practice as the most determining characteristic of a research study for use in practice.

Second, practice-oriented educational research *(2) is conducted in 'real' educational practice contexts*. Acknowledging the complexity of educational practice, where one-size-fits-all solutions do not exist (Schoonmaker, 2007; Gardner, 2011), conducting research in real-life contexts affords learning about this complexity and what solutions could work in specific contexts. Research conducted in practice contexts is also appealing to teachers, because it enables them to determine the fit of a study and its results with their own context (Edwards, 2000; Everton, Galton, & Pell, 2002) and subsequently to interpret and adapt it to be of use in their educational practice (Gardner, 2011). Alignment between the context of a research study and a teacher's educational context makes impact more probable (Gore & Gitlin, 2004). Especially when research is conducted in their immediate context, teachers are inclined to use its results (Brown, 2005).

Third, practice-oriented educational research explicitly *(3) builds on and aims to contribute to both educational research and practice*. Scientific and practical knowledge are two contrasting kinds of knowledge, with the former being more abstract, impersonal and emphasising the simplicity and generality of research findings, and the latter being more context-specific, personal and emphasising the complexity of teaching (McIntyre, 2005). According to McIntyre (2005, p. 362), they are two ends of a spectrum and 'both have inevitable limitations but also have considerable and mutually complementary strengths.' In practice-oriented educational research, scientific and practical knowledge are deliberately combined to strengthen its scientific and practical relevance. This is achieved through *(4) the collaborative involvement of relevant (local) stakeholders* (i.e., researchers and teachers) in practice-oriented educational research studies, which is its fourth characteristic. For a long time, teachers have been positioned as users rather than producers of knowledge, creating a hierarchical and non-reciprocal relationship and ensuing gap between educational researchers and teachers (Gore & Gitlin, 2004). However, teachers have knowledge of educational practice and understand it in a way only teachers can (Metz & Page, 2002). They challenge the credibility and trustworthiness of researchers' studies because researchers lack classroom experience (Gore & Gitlin, 2004). By involving teachers in practice-oriented educational research in different

capacities, their perspective and practical knowledge can be included (Vanderlinde & van Braak, 2010). Collaborative involvement of researchers and teachers in which both consider their respective knowledge as complementary and of equal value (Broekkamp & van Hout-Wolters, 2007), leads to increased mutual understanding between researchers and teachers and a situation in which both can contribute their respective expertise to a practice-oriented educational research study (Edwards, Sebba, & Rickinson, 2007). Hemsley-Brown and Sharp (2003) argue that teacher involvement in research is one of the key facilitators to increase research utilisation, especially on a local level where teachers are directly involved. In a local reciprocal exchange, researchers can learn from practitioners and vice versa so research knowledge can be adapted to a local context (Anwaruddin, 2015).

4.2.2 FRAMEWORK FOR ANALYSING IMPACT OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

In assessing studies that analyse the contributions of practice-oriented educational research, we found that in most studies the use of a conceptual framework to do so is not evident. Studies that do use a framework for analysis tend to focus on singular aspects of impact, for instance distinguishing micro, meso and macro level changes (Bakx et al., 2016), the nature of research use, discriminating tactical, instrumental, conceptual and process use (Tan & Gilbert, 2014), or the aims of teacher research, differentiating between development of the teacher-researchers, classroom practice, school, and education and society in general (Zwart, Smit, & Admiraal, 2015). A noteworthy effort for a comprehensive framework is the framework of ideas on the impact of teacher-led development work as introduced by Frost and Durrant (2002) that was intended as a source of inspiration for the further development of conceptual frameworks and instruments.

Building on (among others) the studies cited above, we developed a conceptual framework of impact of practice-oriented educational research in which we define impact as ‘change in terms of scope, nature and progress in educational practice or research that occurs, whether or not intended, from the product or process of a practice-oriented educational research study’ (Chapter 3, this dissertation). The framework is based on theoretical and empirical elaboration and consists of three

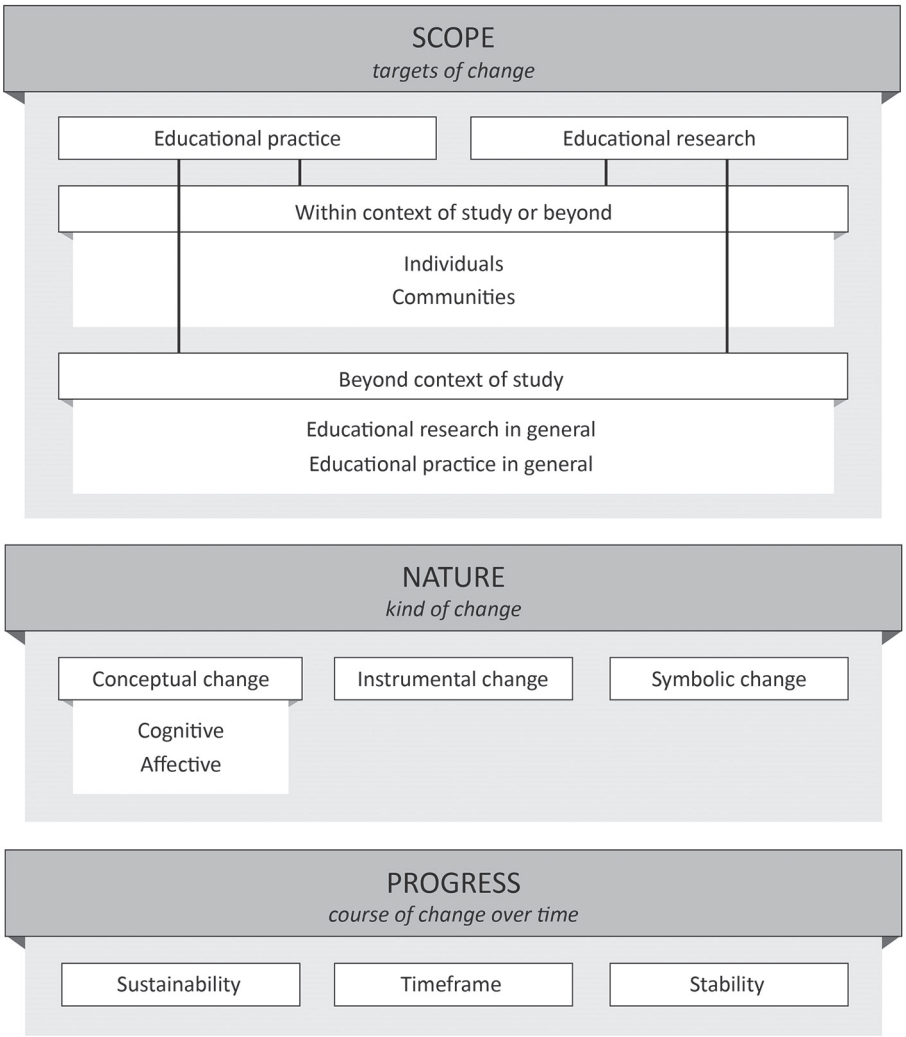

Figure 4.1: Conceptualisation of impact of practice-oriented educational research.

dimensions of impact: scope, nature and progress (Chapter 3, this dissertation). *Scope* indicates the targets of change. These can be individuals or communities in educational practice or educational research, either in the context of a study or beyond, or educational practice or research in general. One of the defining features of practice-oriented educational research is that the scope includes both educational practice and research. *Nature* indicates the kinds of change. Change

can be conceptual, referring to changes in the content or way of thinking and can be both cognitive and affective, instrumental, referring to changes in skills, actions, decisions or achievements, or symbolic, referring to new or changed justifications or substantiations to maintain previously held opinions or practices. Practice-oriented educational research is foremost expected, implicitly or explicitly, to yield instrumental changes in educational practice, at least in the context in which the research is conducted. Furthermore, it is expected to yield cognitive changes in educational research, particularly by contributing to the general scientific knowledge base. *Progress* indicates the course of change over time. This can refer to sustainability of impact, referring to the retention of changes over time, timeframe of change, referring to when changes occur, and to stability of change, referring to shifts in changes over time. An overview of the dimensions and subdimensions of impact is presented in Figure 4.1.

4.3 Research question

Using the conceptual framework of impact, this study analyses the impact of three teacher-researchers' practice-oriented educational research studies and identifies how the characteristics of practice-oriented educational research contribute to achieving impact. We choose to focus on achieved impact in the local school and university contexts of the teacher-researchers' studies. Impact in the local practice context is most likely to occur because the teacher-researchers work in this context and can directly influence it (Kemmis, 2012). Teachers are also most susceptible to research conducted in their local context (Simons, Kushner, Jones, & James, 2003; Brown, 2005). Moreover, most research conducted in schools is mainly intended to improve the local educational practice (McIntyre, 2004). Regarding impact on educational research, contributions to educational research at large by contributing to the scientific knowledge base is most often considered. Impact in the local university context is not the most obvious to analyse, although it is impact that is probable to occur in any research study. By analysing the impact on individuals and communities in local university contexts, this study can illuminate what this impact is. Additionally, it can indicate how impact on a local level can also be, or lead to, a significant contribution to the field of educational research, other than publishing research for an (inter)national audience. Impact on the teacher-researchers themselves has been studied extensively by others and is therefore excluded from this study. This leads to the first research question:

1. *What is the achieved impact, in terms of scope, nature and progress, of teacher-researchers' practice-oriented educational research studies, according to the teacher-researchers and local stakeholders?*

Subsequently, this study relates the achieved impact to the design of the teacher-researchers' practice-oriented educational research studies. By focussing on the study design, we intend to complement existing research that has identified factors that can also affect impact, such as school organisation and culture, the role of the principal, and teachers' beliefs, motivations, expectations and interpretations (e.g., Burkhardt & Schoenfeld, 2003; Gore & Gitlin, 2004; Berger, Boles, & Troen, 2005; Brown, 2005; Broekkamp & van Hout-Wolters, 2007; Cordingley, 2008; Oates, 2008; Dagenais et al., 2012; Anwaruddin, 2015; Lee & Seashore Louis, 2019; Liou, Canrinus, & Daly, 2019), but that are hard to influence or alter. In contrast, the design of practice-oriented educational research studies can be consciously deliberated by practice-oriented educational researchers. This leads to the second research question:

2. *How can the scope, nature and progress of the achieved impact of teacher-researchers' practice-oriented educational research studies be related to their design?*
   (1) emanating from an issue in educational practice
   (2) being conducted in a 'real' practice context
   (3) building on and contributing to educational research and practice
   (4) *collaborative involvement of relevant (local) stakeholders*

Overall, by looking back on the achieved impact and how it can be related to the design of the analysed studies, lessons can be learned on how to design practice-oriented educational research studies for impact.

4.4 Method

This study is a qualitative multiple-case study (Yin, 2009). The research questions are addressed using within and cross-case analysis consecutively.

4.4.1 CONTEXT

In the Netherlands, where this study was conducted, the Ministry of Education and the Dutch Research Council (NWO) are increasingly investing in research conducted by teachers in schools, for example through scholarships for teachers'

doctoral or postdoctoral research projects (van Bergen, Groot, & van der Wel, 2018). The main rationale for these investments is to raise the quality of education through bottom-up educational innovation.

As the context for this study, the postdoctoral research projects of teacher-researchers in secondary education were purposefully selected (Patton, 2002). The research projects were conducted by experienced teacher-researchers whose familiarity with the needs and procedures of both educational practice and research were expected to contribute to achieving impact.

A total of twenty-one teacher-researchers with a doctoral degree in either science, mathematics, or science or mathematics education received a postdoctoral teacher-research grant from the Dutch Ministry of Education based on the quality of their research proposals, including expected impact in educational practice and research. All postdoctoral research studies followed a design-based research approach in which an intervention was designed, implemented and evaluated in an iterative process (cf. McKenney & Reeves, 2012; Bakker, 2018). The teacher-researchers got a secondment at a university for two days per week for two or three years to conduct their research while maintaining their teaching positions in secondary education.

4.4.2 CASE SELECTION

Three exemplary studies were purposefully selected (Patton, 2002) based on the teacher-researchers' research proposals and a preliminary interview at the start of the research projects. The cases were selected to achieve maximum variation (Patton, 2002) on the four characteristics of practice-oriented educational research, as described above. The three studies met the four characteristics of practice-oriented research that are expected to promote impact in different ways, most notably for characteristics 1 (emanating from an issue in educational practice) and 4 (collaborative involvement of relevant local stakeholders). An overview of the selected studies and their features is presented in Table 4.1.

Although this study analyses impact in both educational practice and educational research, case selection was based on features that were expected to influence impact in educational practice, since it has not been empirically explored nor theoretically debated if these or other characteristics of practice-oriented educational research influence impact in educational research in particular.

Table 4.1: Overview of the three cases of practice-oriented educational research and their features.

	Case 1	Case 2	Case 3
Title of research project	Professional development in a teacher development team focussed on design, use and evaluation of context-concept education	Differentiation according to students' interest in mathematics education	Enhancing language proficiency of grade 10 students in science education
Teacher-researcher[1]	Mark	Daniel	Tessa
School subject	Biology	Mathematics	Chemistry
(1) emanating from an issue in educational practice	+	+	+
Who was involved in decision making on the topic of research?	Teacher-researcher	Teacher-researcher	Teacher-researcher Team of upper general secondary education teachers
Expected to be relevant for whom at the school?	All teachers	Upper secondary mathematics teachers (teacher-researcher and one colleague)	10th grade science teachers
(2) conducted in a practice context	+	+	+
Where was it conducted?	Teacher-researcher's school and a partner school	Teacher-researcher's school and a partner school	Teacher-researcher's school
(3) building on and contributing to educational research and practice	+	+	+
(4) collaborative involvement of relevant local stakeholders	+	+	+

Involvement in the intervention	Teachers participated in teacher development teams (TDT)	Teachers used the intervention in their classrooms	Teachers co-developed and used the intervention in their classrooms
Involvement in the research	-	-	Teachers developed instruments, collected and analysed data

Note: [1] Names of the teacher-researchers are pseudonyms

4.4.3 CASE DESCRIPTIONS

Case 1 was a design-based research study with the aim to identify elements of feedback that contribute to teachers' professional development in a teacher development team (TDT). The professional development focussed on design, execution and evaluation of an educational activity following a so-called context-concept approach (see for instance Gilbert, Bulte, & Pilot, 2011). The designed intervention in this study was the set-up of the TDT with the purpose to contribute to teachers' professional development concerning inquiry into their own classroom practice. Participants were teachers from the teacher-researcher's school and a partner school. The TDT was designed and led by the teacher-researcher and a co-lead teacher from the partner school.

Case 2 was a design-based research study with the aim to improve students' motivation for mathematics and their views on the application of mathematics in different contexts by using differentiation based on students' interests. The designed intervention in this study consisted of teaching materials on the topic of differential equations for 12th grade mathematics students using real-life biological/medical, physical/chemical and economic contexts. The intervention was developed by the teacher-researcher and used by the teacher-researcher, one fellow mathematics teacher at his school and one mathematics teacher at a partner school.

Case 3 was a design-based research study with the aim to improve students' language proficiency in 10th grade science education. The designed interventions were teaching materials to improve students' language proficiency in chemistry and biology education. The teacher-researcher collaborated with a teacher research team of five fellow teachers (a biology teacher, a chemistry teacher, an English teacher and two Dutch language teachers) throughout the research project (e.g., in the design and use of the intervention, data collection and analysis).

This study focusses on changes within the teacher-researchers' schools only, since that is where the teacher-researchers' studies originated and where they were mainly conducted.

4.4.4 DATA COLLECTION

Semi-structured interviews were held with the three teacher-researchers after their studies were concluded. Dissemination activities within the schools were

completed (case 1 and 2) or in full progress and close to completion (case 3). Following the dimensions of impact as presented in the conceptual framework of impact (Figure 4.1), the teacher-researchers were asked about the scope, nature and progress of changes resulting from their research projects in their school and university, for example: are there new things that are thought about or things that are thought about differently in response to your research project by yourself or other stakeholders in your school or university? What changes did your research project bring about in discourses? Did your research project confirm pre-existing conceptions or discourses? What is the course of these changes over time?

To familiarise the teacher-researchers with the conceptualisation of impact in terms of scope, nature and progress used in this study, and to stimulate thinking about the impact of their research projects in these terms, they received information about the conceptual framework of impact prior to the interview. They were asked to read the provided information and take some time to think about the impact of their research project. The conceptual framework of impact and its dimensions were also explicated during the interview.

The teacher-researchers were additionally asked to identify key informants that could provide more information on the achieved impact of their research project within their school and university. Subsequent interviews were held with these key informants (i.e., fellow teachers, school principals, university-based colleagues and supervisors). The informants were asked about conceptual, instrumental and symbolic impact on themselves and others in either the school or university context, and progress of impact over time, similar to the interviews with the teacher-researchers. This resulted in actor triangulation (Miles & Huberman, 1994) on the achieved impact. An overview of the key informants and what they were questioned about is presented in Table 4.2. All interviews were recorded and transcribed.

The informants were informed about the use of the interview data for research purposes upon invitation to participate. During the interviews, the purpose of the interview and the research were discussed with the informants. All informants consented to participate in this study.

Table 4.2: Overview of key informants for the three case studies.

	Case 1 *Professional development case*	Case 2 *Students' interest case*	Case 3 *Language proficiency case*	Interviewed about changes …
Fellow teachers	1 Spanish language teacher 1 English language teacher 1 sociology teacher 1 chemistry teacher[1]	1 classical language teacher 1 mathematics teacher 1 physics teacher	2 chemistry teachers[2] 1 Dutch language teacher[2] 1 economics teacher	…for themselves …for their students …within their teacher team …within the school
School principal	1 school principal	1 school principal	1 school principal	…for themselves …within the school
University-based colleagues	n/a	n/a	1 chemistry teacher educator 1 mathematics teacher educator	…for themselves …within the research group
Supervisor	1 assistant professor	1 assistant professor 1 professor	1 assistant professor	…for themselves …within the research group

Notes: [1] co-lead teacher from the partner school; [2] one chemistry teacher and the Dutch language teacher were part of the teacher research team

4.4.5 DATA ANALYSIS

To answer the first research question on achieved impact, the within case analysis followed a deductive qualitative content analysis strategy (Schreier, 2013). A coding scheme was developed with the dimensions of impact (nature, scope, progress), as described in Chapter 3 of this dissertation, as categories and subcategories. Descriptions of all categories and subcategories, examples of coded data and decision rules were combined in a code book which was used for subsequent coding of all data.

The first step of data analysis was selection of quotations containing information on the scope, nature and/or progress of impact. Each selected quotation was summarised in descriptive statements and coded. An example of this is presented in Table 4.3. The second step was data condensation by merging and summarising all descriptive statements with the same codes per informant. The

third step was to merge and summarise the results of the individual informants into one overview matrix (Miles, Huberman, & Salda¶a, 2014) per case. The overview matrices contained all relevant information about the scope, nature and progress of impact.

To answer the second research question on how the scope, nature and progress of achieved impact relate to the characteristics of practice-oriented educational research, the achieved impact of the studies was mutually compared in a cross-case analysis (Yin, 2009). Similarities and differences were related to the features of the studies as described in Table 4.1 based on our understanding of the cases gained from analysing the achieved impact. This resulted in tentative propositions about the relations between the scope, nature and progress of achieved impact and the features of the studies. These tentative propositions were checked in the data, also explicitly looking for disconfirming evidence (Maxwell, 2004), to ensure alignment with informantsô utterances, leading to conformation of the propositions.

Table 4.3: Example of quotation, summarising descriptive statement and coding.

Quotation	Descriptive statement	Coding
I once again became aware that if you want to design something, how to do that. So, for example, that you need to start with your final goal and work from there. And yeah, I am still using the educational activity I designed then in my lessons, I am using them again this year. It also made me aware again of all the intermediate steps you need to take if you want to change something in your practice or if you want to apply something new. What are the things you need to think about? And how can you design that? (Spanish language teacher, *professional development case)*	Teacher became aware (again) of how to design something new for her educational practice.	*Scope* = practice *Target* = individual → teacher *Nature* = conceptual, cognitive
	Teacher keeps using the designed educational activity.	*Scope* = practice *Target* = individual → teacher *Nature* = instrumental *Progress* = sustainable
	Teacher is aware (again) of what needs to be done to change something in her practice.	*Scope* = practice *Target* = individual → teacher *Nature* = conceptual, cognitive

The quality of the data analysis was checked using an audit procedure as developed by Akkerman and colleagues (2006) and expanded by de Kleijn and van Leeuwen (2018). A summative audit was performed by a peer researcher who was not involved in the study. She audited the data analysis of one of the three cases and found the procedure to be visible and acceptable. To increase comprehensibility, she recommended to expand our report of the achieved impact in the results section. We have implemented this recommendation.

4.5 Results

4.5.1 ACHIEVED IMPACT IN TERMS OF SCOPE, NATURE AND PROGRESS

Case 1: The professional development case

The main impact was on the Teacher Development Team (TDT) participants, who reported conceptual and instrumental changes. They learned to design, substantiate and evaluate an educational activity and developed expertise on the topic of that activity, for example on the use of differentiation or digital tools. The TDT participants enjoyed working on the development of an educational activity and used the activity in classroom practice. Use of the educational activities was, however, temporary for two of the interviewed participants. They attributed this lack of sustainable use to alterations in the grade levels they teach, but intended to reuse them when opportunities occur in the future:

> 'Well, currently I am not teaching the same grade level, so the specific grammar assignments I developed cannot be used. But next year, if I teach the 9th grade again, I think I would use them again.' (English language teacher, professional development case)

One of the TDT participants reported sustainable use of the learned knowledge and skills to design new educational activities. Following the teacher-researcher's example, this teacher became interested in research activities. He learned about the teacher-researcher's study on the role of feedback and was trained by the teacher-researcher to lead the school's TDT in the future.

Some fellow teachers expressed interest in the educational activities developed in the TDT and received them from TDT participants, but they did not use them. Upon learning about conditions for successful teacher professional development from the teacher-researcher, the school principal decided to include the TDT in

the school's policy concerning teacher professional development, including mandatory participation for all beginning teachers at the school and a shift in focus in teacher research towards classroom practice. The principal was aware that this would be demanding for these teachers, but she knows from previous participants that, in hindsight, they valued their participation:

> 'We notice that it may be too ambitious, that we ask too much from our teachers, mainly because they are just starting on the job. That makes it difficult to find people to participate in the TDT. They do it, but it is difficult. Their workload is heavy, and they have to be convinced to participate, something which they are not at first. However, when they are participating, they are all glad they did it.' (Principal, *professional development case*)

There was some impact on students. Due to the teacher-researcher's research expertise, the principal gave the teacher-researcher an assignment to develop a research cycle for all student research activities. Visual representations of this cycle were displayed in every classroom and teaching materials were being adapted to align with this research cycle.

Impact within the university was limited to the research supervisor, owing to limited interaction of the teacher-researcher with colleague researchers. The supervisor learned about the set-up of TDTs and used elements from this set-up in teacher training and professional development activities. She was also interested in doing research on TDTs and intended to use the teacher-researcher's results in future research.

Case 2: The students' interest case

The main impact was on mathematic students who participated in the designed intervention. The teacher-researcher's hypothesis was that students' understanding of the use of mathematics and their motivation for mathematics could increase if they would apply mathematics in real life contexts. His study confirmed this hypothesis:

> 'In general, students do not have a really good image of what they can do with mathematics. I tried to give them an image of the use of mathematics that at least approaches reality, also in the students' experience. […] And then you see that they benefit from

> this and react positively. That was my hypothesis and that got confirmed.' (Teacher-researcher, *students' interest case*)

Teachers at the teacher-researcher's school learned about the idea and effects of differentiation according to students' interests. They were interested in using differentiation on interests in their own classroom practice and intended to do that in the future. However, due to other priorities, none of them did:

> 'I am struggling with my students' motivation in the upper grades and I had already been thinking about how to make a better connection between Latin and students' real-life experiences. [After hearing about Daniel's research] I immediately saw a scenario in which I would take texts from different Latin authors and would let students choose one that aligned best with their interests, hoping that their motivation would increase. […] For now, it remains a very interesting idea that rests in the back of our minds to be used at a time when we have nothing else to do, which never happens.' (Classical language teacher, *students' interest case*)

A notable exception was a career development project for students in the ninth grade, in which they could make choices following their own interests. Additional time was allocated for teachers to develop this project.

On a school level, there already was a positive attitude towards research by teachers. In response to the positive experience in this research project, the principle started to increasingly stimulate other teacher research activities.

Impact in the university was on the supervisors and on the research group in general. The supervisors learned about the teacher-researcher's research and about educational practice, which made them think about paying more attention to students' motivation in teacher education. It also made them aware that teacher-researchers have a unique position within a school and the opportunities this provides for professional development of fellow teachers in their schools. For the research group, there was increased interaction with a representative of educational practice to learn about research that has an impact in educational practice.

Case 3: The language proficiency case

The main impact was on the students who participated in the two designed interventions. They became more aware of the importance of language, language proficiency increased, and students started to formulate better. Teachers in the school already knew that students lacked language proficiency. Now they became aware of the importance of increasing students' language proficiency and gained knowledge on how to do that. Following the positive impact on students, the teachers became enthusiastic about the developed interventions and started using them:

> 'You spend more time on language proficiency. Previously I would just tell students to read the question more carefully. Now I can point out an approach, what students should do. So, it is awareness, awareness of how students should do it. That you cannot just identify students' lack of language proficiency, but that you can really point out what they could do to improve it.' (Economics teacher, *language proficiency case*)

Teachers also started paying more attention to their own language usage, leading to changes in their formulations, for example in classroom practice and exams:

> 'I notice, when formulating exam questions, for all my classes, that I am more alert. I am more alert to how to formulate a question.' (Chemistry teacher, *language proficiency case*)

On a school level, the designed interventions were included in the schools' language policy and time was allocated in the school calendar for teachers to pay attention to issues of language. Furthermore, in subject matter teams, teachers were working on enhancing students' language proficiency by collaboratively discussing issues of language and preparing the use of the interventions.

In the university context, the supervisor, teacher educator colleagues and the research group in general became aware of the importance of paying attention to students' language proficiency in science education. Attention to language and the use of one of the interventions was subsequently included in the teacher education programme provided by members of the research group:

> 'Well, for example, in the teacher education programme, we pay more attention to language development since Tessa is working on

> that topic. […] We, sort of right away, included classes in which we point out to pre-service teachers that it is important to teach students not only about chemistry or biology or mathematics, but also to pay attention to language development. Basically, that language development actually plays an important role in understanding chemistry.' (Assistant professor, *language proficiency case*)

4.5.2 SCOPE, NATURE AND PROGRESS OF IMPACT RELATED TO DESIGN FEATURES OF THE STUDIES

The issue of research and how it is established set the scope

The scope of the impact is reflected in the research topic, in terms of the actors or subject matter it focusses on. Our analysis indicates furthermore that the stakeholders who were involved in establishing the issue of research, subsequently report impact (i.e., become part of the actualised scope). In the *professional development case*, the research was expected to be relevant for all teachers in the school, because all teachers could potentially participate in the TDT and because impact could spread beyond the TDT participants to fellow teachers. Yet only a limited number of teachers actually participated in the TDTs with the others not reporting impact. In establishing the issue of research, the teacher-researcher was inspired by his principal's wish to have more teacher inquiry in the school and the school association's wish to establish TDTs for teacher professional development. Accordingly, the principal reported impact on school policy for beginning teachers, with TDT participation becoming mandatory.

In the *students' interest case,* the scope, as expected, covered the upper secondary mathematics teachers in the school who could use the designed teaching materials in classroom practice. The issue to be researched, as well as the context in which the research was to take place, was determined individually with certain aspired impact in mind:

> 'I think that concerning aspired impact I had limited ideas about impact beyond myself and those classes, my own classes. I was quite self-centred in that when I started. […] My first idea was: I am going to do this because I want to show something to my students. That was my main aim. So, it has more, broader impact than I anticipated. Well, anticipated is too big a word, but which I did not

> think about, which was not on my mind.ô (Teacher-researcher, *students' interest case*)

Despite the individual origin, the actualised scope showed that fellow teachers from other subjects and grade levels became interested in using the ideas of differentiating according to studentsô interest and using real life contexts in classroom practice but did not expect to actually start using them in teaching.

In the *language proficiency case*, the teacher-researcher decided on the research topic in consultation with the team of upper general secondary education teachers, including teachers from all subject sections. She focussed primarily on science education, since that was her own subject area and to limit the extend of her research. Hence, the research was expected to be relevant for the 10th grade science teachers in the school. The achieved impact showed that there was impact on teachers from other subject areas and grade levels as well. Moreover, beyond individual teachers, impact also occurred on community levels of subject matter sections and the school. This appeared to be related to how local stakeholders were involved during the study, which is detailed in the next section.

Nature of change reflects the nature of the collaborative involvement of relevant stakeholders

The nature of the achieved impact reflects how stakeholders were involved during the research. In the *professional development case,* the TDT participants were directly involved in the intervention as participants in the TDT. As a result, they reported instrumental changes in their classroom practice, namely the use of the developed teaching materials. Furthermore, the principal who had stressed the importance of teachersôprofessional development concerning inquiry into their own classroom practice upfront, brokered instrumental impact on the school level by including the TDT and mandatory participation for beginning teachers in the schoolôs policy.

In the *students' interest case* there was instrumental impact on the mathematics teachers who were involved in the teacher-researcherôs intervention by using the designed teaching materials. Impact on other teachers was limited to cognitive and affective impact. They learned about the possibility of differentiation according to studentsôinterest and the use of real-life contexts, how it has positive impact on students, and they were interested in using these ideas in their own classroom practice. However, there are no instrumental changes in their

classroom practice, meaning that the fellow teachers are not actually applying the ideas they gained from the teacher-researcher's study:

> 'I found it interesting to see that if you show students something in a context that is interesting to them, that they start enjoying and become more interested in mathematics or that they gain a better view of its application. And so I have thought about, how can we use that in our physics education at some point? That has not led to any concrete actions yet. That is partly due to the fact that I and my colleague also have other things to do and did not have a lot of time to develop new things. But it stays in the back of my mind, because I find it interesting.' (Physics teacher, *students' interest case*)

In the *language proficiency case,* a teacher research team of five fellow teachers was closely involved in the teacher-researcher's study, both in the research and the development and use of the interventions. Participation in this research team was voluntary. Members actively promoted the research and the developed interventions within the school towards fellow teachers:

> 'It is a very nice research project, so we are proud of it' (Dutch language teacher, part of the teacher research team, *language proficiency case*)

> 'Towards colleagues I am promoting it. Indicating that I am seeing that it works, and well, being enthusiastic about it. Yeah, sharing it, you know?' (Chemistry teacher, part of the teacher research team, *language proficiency case*)

This led to conceptual and instrumental impact on the members of the research team and successively on the fellow teachers. They gained knowledge about how to support the improvement of students' language proficiency and started using the designed interventions in classroom practice. The schoolwide desire to improve students' language proficiency, which contributed to the establishment of the issue of research, led fellow teachers and the principal to experience involvement with the study resulting in instrumental impact on the school level, namely inclusion of the designed interventions in the school's policy.

Sustainable progress through (shifting) materialisations

Concerning progress, reification of (parts of) the research seems conditional for sustainable impact. In the *professional development case,* TDT participants developed teaching materials for their own classrooms and intended sustainable use. One of the interviewed TDT participants additionally continued using the knowledge and skills to design, substantiate and evaluate *new* educational activities after completion of his participation in the TDT:

> 'During participation in the TDT, I designed an educational activity and that idea of designing that I used then, I continue to use that more often in my lessons, because I enjoy doing that. […] Every time I design an educational activity, I am alert to use the elements I learned in the TDT. […] I pay attention to it, I think about it when I am designing.' (Sociology teacher, *professional development case*)

This teacher participated voluntarily in the TDT, in contrast to the other interviewed teachers for whom participation was mandatory due to the school's changed policy concerning teacher professional development.

In the *students' interest case*, sustainable impact was realised via the development of teaching materials that the teacher-researcher and his fellow mathematics teacher reported to use sustainably. Future generations of students are therefore likely to experience similar impact as the students who participated in the teacher-researcher's study, resulting in sustainable impact on students.

In the *language proficiency case*, the impact on teachers within the school, including impact on subject section and school levels, occurred partly during the research study and partly after its conclusion. Impact within 10th grade science education during the research study was anticipated, because that was the immediate context in which the study was conducted. The expanding scope of impact within the school started during the course of the study. Following from the inclusion of the interventions in the school's language policy and allocated time in the school calendar to pay attention to language issues, the impact within the school was considered sustainable by the school principal:

> 'I expect it to be sustainable. I notice that, partly because we issued it in our language policy, that it keeps growing. Things grow when you pay attention to them. So, if we keep asking each other

> regularly, in sections and in teams, how people are applying issues from the language policy, then people are made to be continuously critical about how they formulate exam questions, how they write things down, how they apply the interventions et cetera.' (School principal, *language proficiency case*)

Also, in each case, at least part of the impact shifted beyond expectations and aspirations of the research. This concerned the visual representations of the research cycle developed by the teacher-researcher in the *professional development case*, the career development project in the *students' interest case* and teachers' attention to their own formulations in the *language proficiency case*. This shifting of impact beyond the research does not appear to be indicative of impact watering down, but of the research becoming a meaningful part of educational practice in less obvious ways.

4.6 Conclusions, discussion, limitations and future research

4.6.1 CONCLUSIONS AND DISCUSSION

The aim of this study was to identify how the achieved impact of teacher-researchers' practice-oriented educational research studies in the local school and university contexts relates to design features of the studies. We have analysed the impact of three practice-oriented educational research studies conducted by teacher-researchers and found that differences in the scope, nature and progress of impact in *the school contexts* can be related to differences in the design features of the research studies. The scope, nature and progress of impact in *the university contexts* also differed for the three studies, but we could not identify how they relate to design features of the studies.

The *scope* of the impact of the practice-oriented educational research studies in the schools is inherently connected to the topic of research and to whom it can be relevant. That the topic of study should be relevant for stakeholders in educational practice has been argued abundantly (e.g., Doyle & Ponder, 1977; Kennedy, 1997; Everton, Galton, & Pell, 2002; Gore & Gitlin, 2004; Vanderlinde & van Braak, 2010; Farley-Ripple et al., 2018), and correspondingly one of the defining characteristics of practice-oriented educational practice is that the issue to be researched emanates from educational practice. Our analysis indicates that to achieve impact, a latent or broad relevance may not suffice; the topic needs to

be an issue in *local* educational practice. When relevant local stakeholders are involved in establishing the topic of research, for example in discussions with the teacher-researcher or decision making on the topic of research, they are more likely to report impact. Inclusion of stakeholders in establishing the research topic can thus contribute to actualising impact.

The *nature* of impact in the schools follows the nature of the involvement of local stakeholders during the research. When stakeholders are involved more substantially, impact moves beyond conceptual to instrumental impact, from changes in knowledge and thinking to changes in actions and policy. This aligns with findings by Hemsley-Brown and Sharp (2003) who identified involvement of stakeholders from educational practice as a key strategy to increase the use of research. Our findings expand this notion by explicating that the nature of the impact reflects the nature of the involvement.

The *progress* of impact in the schools did not appear to be directly related to the distinguishing characteristics of practice-oriented educational research, but can be incorporated in a research design. Making sure that the research, in terms of its underlying ideas (e.g., differentiation to interest), interventions (e.g., teaching materials) or findings (e.g., guidelines for language use) is reified in concrete products that can be used in daily practice, seems imperative. Less straightforwardly translated into the research design is the finding that impact can shift beyond the research in meaningful ways, without upfront aspirations or intentions. The importance of meaningful adaptions of research innovation has been stressed by others (Engeström, 2011). We concur that the shifting of impact is not a shortcoming, but can lead to valuable changes. More attention for and stimulation of this shifting impact seems prudent.

The scope, nature and progress of impact *in the university contexts* could not be related to the features of the teacher-researchers' practice-oriented educational research studies. Perhaps plausibly, as the teacher-researchers selected a topic of study based on expected relevance within their school; relevance to individuals and communities in the university context were not taken into account. Also, the research itself took place at school, limiting the substantive involvement of university colleagues. Additionally, the teacher-researchers had a permanent appointment at their school and a temporary secondment at the university, and they spent more time at the school than at the university during the duration of the research studies. It is therefore expected that the teacher-researchers had

more personal connections and interactions with colleagues at their school than at the university, resulting in more opportunities for the teacher-researchers to share and embed their research within the school than the university. And last, the teacher-researchers might have focussed less on impacting individuals and communities in the university, and mostly focussed on impacting educational research on a general level, by contributing to the scientific knowledge base via the publication of peer-reviewed articles in (inter)national journals. Yet, although impact in the university contexts was limited, it should not be overlooked that it can be significant in the local context and potentially on larger scales, for example by contributing to other researchers' future research plans or to changes in a teacher education programme.

Upfront, we identified several gaps in existing studies on the impact of teacher-researchers' practice-oriented educational research studies. This study addressed these gaps by analysing the achieved impact beyond the teacher-researcher in the school and university contexts of three exemplary practice-oriented educational research studies conducted by teacher-researchers, and by relating the achieved impact to the features of the studies. The achieved impact is explicated in terms of scope, nature and progress, resulting in an in-depth understanding of the changes in the local educational practice and research contexts. Bakx and colleagues (2016) concluded that teacher-researchers with a concurrent position as a teacher at a secondary school and as a researcher at a university can act as brokers between universities and schools. This study shows that they can also act as brokers between schools and universities, for example by changing researchers' perspectives on educational practice or contributing to teacher education programmes.

We want to emphasise that, in our opinion, none of the achieved changes of the three analysed cases is better or worse than the others, just different. The achieved impacts of the studies to some extent align with the starting points of the research projects: for the *professional development case* to provide professional development for teachers concerning inquiry into their own classroom practice, for the *students' interest case* to increase students' motivation and their understanding of the application of mathematics, and for the *language proficiency case* to improve students' language proficiency. All studies are therefore considered successful in achieving aspired impact by their design.

Additionally, all studies actualised intended publication of their research in (inter)national peer-reviewed journals.

The conceptual framework of impact as established in Chapter 3 of this dissertation is found to be suitable to analyse the impact of practice-oriented educational research studies in the school and university contexts in which the studies are conducted. Clear overviews of the scope and nature of achieved impact can be established. Gaining insight in the progress of impact proved to be difficult, but this can be an artefact of our study. Data was collected at one moment in time, whereas data collection over a longer time period could provide more insight in the course of impact over time.

4.6.2 LIMITATIONS

First and foremost, our study focussed on impact as related to research design without considering factors outside of the research that are known to affect impact. For a complete picture, all factors should be taken into account.

Second, data on achieved impact of the teacher-researchers' practice-oriented educational research studies were collected from the teacher-researchers as well as from key stakeholders identified by the teacher-researchers. The achieved impact described in this study therefore relies on their perceptions of achieved impact and is consequently subjective. However, in line with Gardner, Holmes and Leitch (2008, p. 101), we contend that the use of subjective and impressionistic data is legitimate in circumstances in which 'hard or rigorous' evidence is unfeasible to collect due to the complexity of the issue.

Third, only the achieved impact in the teacher-researchers' schools was included, even though in two cases, teachers and students from partner schools were involved in the studies. As a result, not all impact in the school contexts is included in this study, even though it is plausible that the achieved impact in the partner schools differed from the teacher-researchers' schools. Differences in achieved impact could result from differences in the context, such as school culture, policy or leadership. However, it is also conceivable that differing impact in the partner schools results from the fact that they are *not* the teachers-researchers' schools. The issue of research could have less or more relevance in the partner schools, and stakeholders could feel less or more involved in the research projects because the teacher-researcher is not a direct colleague.

Fourth, the study provided limited insight in how achieved impact in the university contexts relates to features of the teacher-researchers' practice-oriented educational research studies. It could be more related to other aspects than the features of the studies, for example characteristics of the context or the process of research (Frost & Durrant, 2002). Future research including aspects beyond the inherent features of the studies could reveal explanatory factors for achieved impact in educational research and additional explanatory factors for achieved impact in educational practice.

Last, the study of achieved impact was limited to impact in the school and university contexts in which the teacher-researchers conducted their studies. However, practice-oriented educational research generally also aspires impact beyond the immediate contexts. It remains an issue for future research to identify achieved impact beyond the local contexts and how it relates to the characteristics of practice-oriented educational research.

4.6.3 IMPLICATIONS

This study focussed on what researchers themselves can do to foster impact. Even though impact is also markedly affected by issues outside of the design of the study, practice-oriented educational researchers, whether teacher-researchers or university-based researchers, can take steps in their research designs to achieve impact in their local context. If practice-oriented educational researchers aim to have significant impact in educational practice, they should move beyond their own expected relevance and collaborate with local stakeholders in determining the research topic and involve stakeholders in their studies in substantive ways. It also seems imperative to reify the research in concrete products that can be used in educational practice, both during and after the study, and encourage others to use the research, also in unexpected ways.

5. SAMENHANG TUSSEN KWALITEIT EN IMPACT VAN PRAKTIJKGERICHT ONDERWIJSONDERZOEK: EEN EMPIRISCHE VERKENNING

SAMENVATTING

De samenhang tussen kwaliteit en impact krijgt weinig aandacht in discussies over praktijkgericht onderwijsonderzoek. Een nadere verkenning van die samenhang is wenselijk, aangezien het denkbaar is dat samenhang in welke hoedanigheid dan ook gevolgen kan hebben voor bijvoorbeeld de uitvoering, waardering en financiering van praktijkgericht onderwijsonderzoek. Het doel van dit onderzoek is de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek te verkennen en beter te begrijpen. Gevoed door mogelijke vormen van samenhang tussen kwaliteit en impact, zoals beschreven in de literatuur, zijn zes experts op het gebied van praktijkgericht onderwijsonderzoek gevraagd naar hun kijk op mogelijke vormen van samenhang. De resultaten laten zien dat perspectieven op samenhang tussen kwaliteit en impact verschillen op drie aspecten: (1) de invullingen van kwaliteit en impact, (2) de volgordelijkheid van kwaliteit en impact en (3) de werkelijkheid, aannemelijkheid en wenselijkheid van vormen van samenhang tussen kwaliteit en impact. Dit onderzoek biedt empirische input voor meer genuanceerde en scherpere discussies over de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek en de mogelijke consequenties ervan.

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5. INTERRELATEDNESS OF QUALITY AND IMPACT OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH: AN EMPIRICAL EXPLORATION

ABSTRACT

The interrelatedness of quality and impact does not receive a lot of attention in discussions on practice-oriented educational research. Exploring this interrelatedness is desirable, since the interrelatedness can have consequences for practice-oriented educational research. The aim of this study is to increase understanding of the interrelatedness of quality and impact of practice-oriented educational research. Informed by possible forms of interrelatedness of quality and impact from the literature, six Dutch experts on practice-oriented educational research were interviewed about their views on the interrelatedness of quality and impact. Results show that perspectives on interrelatedness can differ on three aspects: (1) interpretations of quality and impact, (2) the sequence of quality and impact, and (3) the reality, plausibility and desirability of forms of interrelatedness. This study offers an empirical base for more nuanced discussions on the interrelatedness of quality and impact of practice-oriented educational research and its possible implications.

5.1 Inleiding

Praktijkgericht onderwijsonderzoek is wetenschappelijk onderzoek met het expliciete tweeledige doel bij te dragen aan zowel de wetenschap als de onderwijspraktijk. Kenmerkend voor praktijkgericht onderwijsonderzoek is verder dat het start vanuit een probleem in de onderwijspraktijk, wordt uitgevoerd in de onderwijspraktijk met betrokkenheid van relevante belanghebbenden (bijvoorbeeld docenten en onderzoekers) en voortbouwt op en beoogt bij te dragen aan wetenschap en praktijk (NRO, 2020). Praktijkgericht onderwijsonderzoek kan op basis van deze kenmerken een grote variatie aan onderzoeken behelzen. Vraagstellingen kunnen bijvoorbeeld voortkomen uit ®®n school of juist op grote schaal spelen. Daarnaast kunnen belanghebbenden verschillende rollen spelen in een onderzoek. Docenten kunnen bijvoorbeeld betrokken zijn als (mede)onderzoekers, of als ontwerpers of uitvoerders van interventies; onderzoekers kunnen een leidende of juist een begeleidende rol hebben in een onderzoek. Ook de (beoogde) bijdragen aan wetenschap en praktijk kunnen verschillen in scope en aard. Alle variaties aan onderzoeken passend binnen de gegeven kenmerken, zoals ontwerponderzoek, actieonderzoek, lesson study en praktijkgericht onderwijsonderzoek door docenten, worden in dit onderzoek onder praktijkgericht onderwijsonderzoek gevat.

Gegeven het tweeledige doel van praktijkgericht onderwijsonderzoek streven onderzoekers gelijktijdig impact na in de wetenschap ®n in de onderwijspraktijk op basis van onderzoek dat voldoet aan wetenschappelijke kwaliteitsnormen. De vaak impliciete aanname hierbij is dat voldoen aan dergelijke kwaliteitsnormen het behalen van impact ondersteunt. Van Tartwijk (2011) bijvoorbeeld benoemt de kwaliteit van theorievorming als voorwaarde voor impact in de onderwijspraktijk. Kwaliteit en impact liggen dan in elkaars verlengde. Daarentegen benoemt Hammersley (2003) kwaliteit en impact als twee tegenstrijdig ervaren overwegingen binnen onderwijsonderzoek waartussen keuzes gemaakt moeten worden: goed onderzoek doen of impact behalen. Daarnaast zijn er talrijke voorbeelden van goede onderzoeken met weinig impact en van minder goede onderzoeken met veel impact, hetgeen de vraag oproept of kwaliteit en impact ¿berhaupt op enige wijze met elkaar samenhangen.

Hoe kwaliteit en impact van praktijkgericht onderwijsonderzoek met elkaar samenhangen is niet evident en krijgt weinig expliciete aandacht in discussies

over praktijkgericht onderwijsonderzoek. Naast dat het een theoretisch interessante exercitie is om na te gaan hoe naar samenhang tussen kwaliteit en impact gekeken kan worden, is het ook praktisch zinvol. Immers, ideeën over samenhang kunnen allerlei consequenties hebben, bijvoorbeeld voor de uitvoering, waardering en financiering van praktijkgericht onderwijsonderzoek. Of kwaliteit als voorwaarde, tegenpool of onafhankelijk van impact gezien wordt, kan bijvoorbeeld bepalen of en wanneer er in een onderzoeksproces aandacht is of zou moeten zijn voor kwaliteit en impact. Daarnaast kan een beter begrip van de samenhang helpen bij het opzetten van praktijkgericht onderwijsonderzoek of projectaanvragen.

Het doel van dit onderzoek is om de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek te verkennen en beter te begrijpen. Hierbij impliceert impact nadrukkelijk een tweeledige bijdrage aan praktijk én wetenschap, ook al wordt dat laatste gewoonlijk niet als impact aangeduid, maar beschreven als bijdrage. Bestaande, vaak impliciete ideeën over vormen van samenhang uit de literatuur worden expliciet gemaakt in een theoretisch kader. Dit theoretisch kader vormt het vertrekpunt voor een kwalitatieve empirische verkenning. Zes experts zijn gevraagd naar hun kijk op (vormen van) samenhang tussen kwaliteit en impact. Het streven van het onderzoek is niet om te komen tot consensus. Bovenal gaat het om begripsvergroting door te leren van de verschillende mogelijkheden en perspectieven (cf. Moss, Phillips, Erickson, Floden, Lather, & Schneider, 2009).

5.2 Theoretisch kader

5.2.1 KWALITEIT EN IMPACT

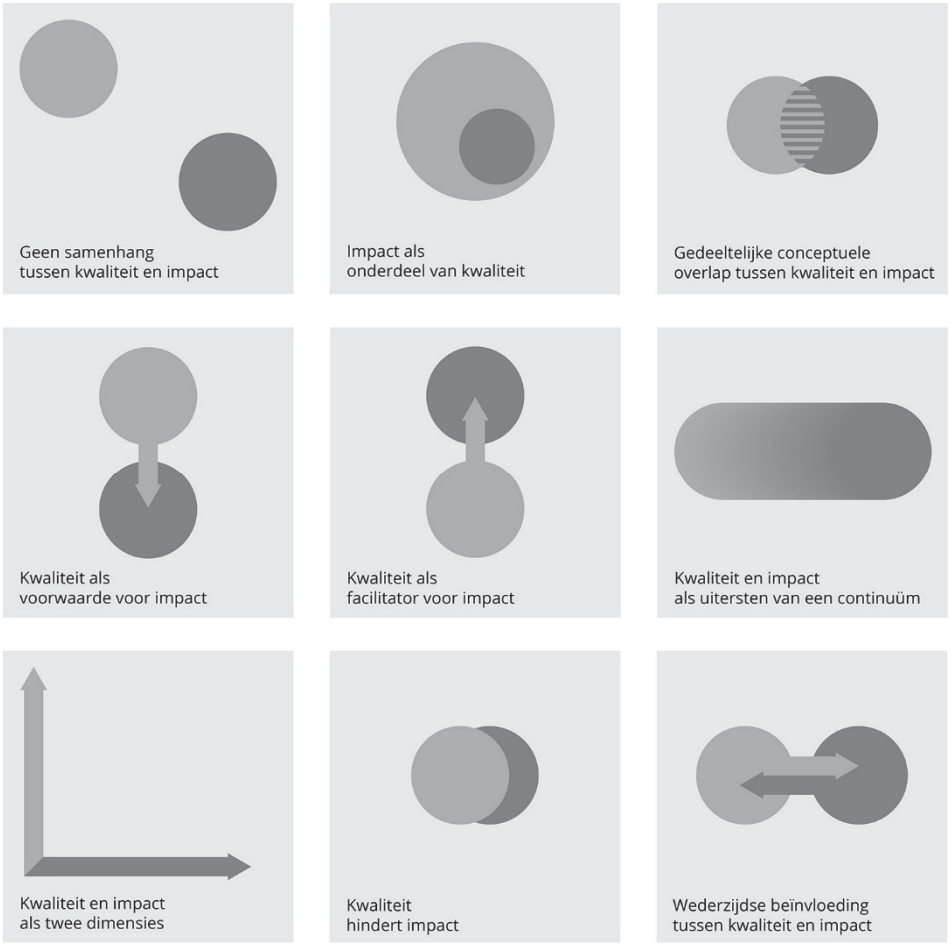
In discussies over kwaliteit en/of impact van (praktijkgericht) onderwijsonderzoek worden in de literatuur verschillende termen gebruikt, zoals validiteit en relevantie (Hammersley, 2003), rigor en relevantie (Gutiérrez & Penuel, 2014), kwaliteit, resonantie en significante bijdrage (Tracy, 2010), methodische grondigheid en praktische relevantie (Andriessen, 2014), rigor, validiteit, kenniscreatie en disseminatie (Anderson & Herr, 1999), excellentie en gebruikswaarde (Oancea & Furlong, 2007), gebruik van onderzoek (Hemsley-Brown & Sharpe, 2003), bruikbaarheid en haalbaarheid in praktijk en wetenschap (Ros & Vermeulen, 2010), output en transformatie van kennis richting de praktijk (Cordingley, 2008), kennisbenutting (Voogt, McKenney, Pareja Roblin, Ormel & Pieters, 2012) en

kennismobilisatie (Cooper, Levin & Campbell, 2009). Ondanks verschillende nuances in betekenis en daaruit voortvloeiende verschillen in hoe samenhang tussen de individuele concepten gepercipieerd kan worden, lijken de termen ook gedeelde betekenissen te hebben en als synoniemen voor kwaliteit en impact gebruikt te worden door de verschillende auteurs.

Uit verkenning van de literatuur blijkt dat de invullingen van kwaliteit en impact van praktijkgericht onderwijsonderzoek van groot belang zijn voor percepties van hun samenhang en vice versa. Mede gezien het exploratieve karakter van deze studie kiezen we er echter voor om g®®n vooropgestelde definities van kwaliteit en impact te hanteren. In de literatuur vonden wij namelijk geen vaststaande of onomstreden definities van kwaliteit en impact of bovengenoemde synoniemen. Enig houvast wat betreft de invulling van kwaliteit en impact van praktijkgericht onderzoek is echter wenselijk. De definitie van praktijkgericht onderwijsonderzoek en daaruit voortvloeiende implicaties voor kwaliteit en impact worden hiervoor als uitgangspunt genomen. De definitie van praktijkgericht onderwijsonderzoek als wetenschappelijk onderzoek met het tweeledige doel bij te dragen aan wetenschap en praktijk (NRO, 2020) biedt houvast op twee punten. Ten eerste impliceert die definitie dat kwaliteit moet voldoen aan standaarden voor wetenschappelijk onderzoek. Vanwege onze keuze om kwaliteit niet verder te defini±ren laten we open wat die standaarden zijn. Ten tweede impliceert de definitie van praktijkgericht onderwijsonderzoek dat impact (beoogde) bijdragen aan zowel praktijk als wetenschap behelst. In dit artikel wordt telkens expliciet aangegeven als van (een van) deze uitganspunten wordt afgeweken.

5.2.2 SAMENHANG TUSSEN KWALITEIT EN IMPACT VAN PRAKTIJKGERICHT ONDERWIJSONDERZOEK

De meeste literatuur over kwaliteit en impact van praktijkgericht onderzoek richt zich op ®®n van beide concepten, waarbij impact overwegend wordt beperkt tot de onderwijspraktijk. Literatuur die de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek expliciet adresseert, is schaars. In literatuur over kwaliteit, impact en gerelateerde concepten met een soortgelijke strekking (zoals in de voorgaande paragraaf benoemd) worden verschillende vormen van samenhang (vaak impliciet) beschreven. Die worden weergegeven en getypeerd in Figuur 5.1 en onderstaande begeleidende tekst.



(Opmerking: 'wederzijdse beïnvloeding tussen kwaliteit en impact' wordt niet benoemd in het theoretisch kader, enkel in de resultatensectie.)

Figuur 5.1: Vormen van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek.

Op basis van empirisch onderzoek stellen verschillende auteurs dat er *geen samenhang* tussen kwaliteit en impact is. Oolbekkink-Marchand, van der Steen en Nijveldt (2014) en Leuverink en Aarts (2019) operationaliseerden de kwaliteitsnormen van Anderson en Herr (1999) om de kwaliteit van praktijkgericht onderwijsonderzoek uitgevoerd door docenten in kaart te brengen en vervolgens uitspraken te doen over impact binnen de schoolcontext. Oolbekkink-Marchand en collega's concluderen dat voldoen aan de kwaliteitsnormen van Anderson en

Herr (die voornamelijk betrekking hebben op positionering van een onderzoek in de praktijk en potentie voor impact in die praktijk) en het behalen van impact niet per se duiden op inherente onderzoekskwaliteit, bijvoorbeeld in termen van coherentie tussen de verschillende delen van een onderzoek. Leuverink en Aarts komen tot een soortgelijke conclusie nadat zij constateerden dat door docenten uitgevoerd praktijkgericht onderwijsonderzoek dat zij analyseerden wel impact had in de praktijk terwijl de kwaliteit te wensen over liet. Vergelijkbare conclusies volgen uit de empirische onderzoeken van Vrijnsen-de Corte (2012) en Foster (1999). Beiden analyseerden praktijkgericht onderwijsonderzoek door docenten volgens door henzelf opgestelde normen voor kwaliteit en impact in de onderwijspraktijk. Vrijnsen-de Corte vond dat onderzoeken van hoge kwaliteit niet per se leidden tot veranderingen in de onderwijspraktijk, terwijl Foster juist vond dat kwalitatief slechte onderzoeken soms veel impact hadden binnen een school. Naast deze empirische bevindingen bestaan er ook conceptuele argumenten waarom er geen samenhang tussen kwaliteit en impact kan bestaan. Verschillende auteurs (Cordingley, 2008; Colley, 2014) beargumenteren dat het behalen van impact in de praktijk of het ontbreken daarvan niets zegt over de waarde of kwaliteit van een onderzoek, omdat het behalen van impact sterk afhangt van omstandigheden buiten een onderzoek. Bijvoorbeeld, docenten kunnen onderzoeksresultaten naast zich neerleggen vanwege gebrek aan aansluiting op intellectueel, praktisch en emotioneel vlak (Cordingley, 2008) of vanwege sociale, institutionele of politieke redenen (Colley, 2014). Door kwaliteit aan de praktijkimpact van een onderzoek te verbinden krijgen gebruikers bovendien (impliciet) iets te zeggen over de kwaliteit van een onderzoek en dat beschouwt Colley (2014) als onwenselijk. Daarnaast beargumenteert Bridges (2009) dat het veronderstellen van samenhang tussen kwaliteit en impact in de wetenschap onwenselijke gevolgen kan hebben. Hij beschouwt kwaliteit als intrinsieke en impact als extrinsieke eigenschap van een onderzoek. Als de kwaliteit van een onderzoek beoordeeld wordt op basis van extrinsieke impactindicatoren als aantallen publicaties, citaties en downloads, dan kunnen onderzoekers gaan toewerken naar hogere scores op die extrinsieke indicatoren zonder voldoende oog te hebben voor de intrinsieke kwaliteit van hun onderzoek. Kwaliteit van een onderzoek moet dus beoordeeld worden op intrinsieke eigenschappen (Bridges, 2009), omdat impact en bijbehorende indicatoren niets zeggen over de inherente kwaliteit van een onderzoek.

Andere auteurs beschouwen *impact als onderdeel van kwaliteit*. Zo beschrijft Tracy (2010) acht kwaliteitsnormen voor kwalitatief onderwijsonderzoek waarvan twee gerelateerd aan impact. Zij stelt dat een goed onderzoek personen beïnvloedt en hen in beweging zet, en een significante bijdrage levert op conceptueel, praktisch, moreel, methodologisch of heuristisch vlak. Anderson en Herr (1999) beschrijven onder andere 'outcome validity' als een kwaliteitsnorm voor onderwijsonderzoek door docenten. Hiermee zeggen zij dat een goed onderzoek leidt tot het oplossen van de praktijkkwestie waarmee het onderzoek startte. Specifiek voor praktijkgericht onderwijsonderzoek benoemen Oancea en Furlong (2007) 'gebruikswaarde' als mogelijke kwaliteitsnorm. Zij benadrukken hierbij dat het niet gaat om behaalde impact, maar de potentiële waarde en mogelijkheden die een onderzoek biedt om impact in de onderwijspraktijk te realiseren. Zowel behaalde impact, potentiële impact als mogelijkheden tot het behalen van impact kunnen dus onderdeel uitmaken van en bijdragen aan de kwaliteit van een praktijkgericht onderwijsonderzoek. Dit betekent echter niet per se dat impact volledig onderdeel uitmaakt van kwaliteit. Het is ook mogelijk dat invullingen van impact en kwaliteit gedeeltelijk overlappen waardoor er een *gedeeltelijke conceptuele overlap tussen kwaliteit en impact* ontstaat. Zo houdt 'gebruikswaarde' (Oancea & Furlong, 2007) verband met zowel de kwaliteit van een onderzoek als de impact. Aangezien kwaliteit en impact meer omvatten dan alleen 'gebruikswaarde', vormt de gebruikswaarde de conceptuele overlap tussen beide. De conceptuele overlap tussen kwaliteit en impact kan ook gevormd worden door 'relevantie', want dit kan zowel een kwaliteitsnorm als een voorwaarde voor impact zijn (Gutiérrez & Penuel, 2014).

Verder komt uit twee discussiestukken - een over wat redelijkerwijs verwacht mag worden van de impact van onderwijsonderzoek en een ander over validiteit en kwaliteit van actieonderzoek - naar voren dat praktische implicaties alleen kunnen volgen uit kwalitatief goed onderzoek (Edwards, 2000) en dat docenten redenen moeten hebben om onderzoek te vertrouwen voordat zij hun onderwijspraktijk daarop kunnen baseren (Feldman, 2007). Zij stellen dus dat alleen kwalitatief goed onderzoek impact kan hebben in de onderwijspraktijk. Foster (1999) stelt het scherper door te zeggen dat goede kwaliteit voorwaardelijk voor impact moet zijn. In zijn empirische onderzoek naar kwaliteit en impact van praktijkgericht onderwijsonderzoek door docenten vond hij dat ook kwalitatief slechte onderzoeken impact hadden in de onderwijspraktijk en dat beschouwt hij als onwenselijk en zelfs gevaarlijk. Volgens deze redeneringen geldt *kwaliteit als*

voorwaarde voor impact en kan/mag er zonder kwaliteit geen impact zijn. Kwaliteit omvat volgens de genoemde auteurs goed onderzoek volgens wetenschappelijke standaarden, bijvoorbeeld in termen van betrouwbaarheid (Edwards, 2000), validiteit (Feldman, 2007), en helderheid, validiteit en relevantie (Foster, 1999). Gardner (2011) is iets minder stellig en acht praktijkimpact waarschijnlijker als een onderzoek van goede kwaliteit is, bijvoorbeeld in termen van toegankelijkheid, relevantie, overtuigingskracht, geloofwaardigheid en/of gezaghebbendheid, omdat docenten dan eerder geneigd zijn er iets mee te doen dan als dat niet het geval is. Volgens deze redenering geldt *kwaliteit als facilitator voor impact*. In een eigen onderzoek naar praktijkperspectieven op kwaliteit van praktijkgericht onderwijsonderzoek (Groothuijsen, Bronkhorst, Prins, & Kuiper, 2020) werd hetzelfde geconcludeerd. Docenten bleken eerder geneigd iets met een onderzoek te doen als het in hun perceptie voldoet aan kwaliteitsnormen wat betreft toepasbaarheid, herkenbaarheid en effectiviteit. Kwaliteit in de perceptie van docenten is daarmee een facilitator, maar geen garantie voor impact. Kwaliteit kan ook een facilitator zijn voor impact in de wetenschap. Kwaliteitsnormen voor wetenschappelijke publicaties creëren voor wetenschappers de mogelijkheid om de kwaliteit van een onderzoek op waarde te schatten (Edwards, 2000). Onderwijsonderzoek dat door een peerreviewproces heen komt, wordt beschouwd als onderzoek met voldoende kwaliteit dat gepubliceerd kan worden. Vervolgens kan impact in de wetenschap ontstaan.

Kwaliteit en impact kunnen elkaar ook bijten. Hammerley (2003) bijvoorbeeld benoemt kwaliteit en impact (‘validity’ en ‘relevance’) als twee tegenstrijdig ervaren overwegingen bij het doen van onderzoek, dat wil zeggen goed onderzoek doen of impact in de onderwijspraktijk behalen. Onderzoekers en het soort onderzoek dat zij uitvoeren, meer wetenschappelijk of meer praktijkgericht, bepalen welk van de twee het meeste gewicht krijgt. Ros en Vermeulen (2010) volgen een soortgelijke redenering door te stellen dat er twee concurrerende soorten kwaliteitsnormen zijn voor praktijkgericht onderwijsonderzoek. Ieder praktijkgericht onderwijsonderzoek moet volgens hen een eigen balans vinden tussen deze wetenschappelijke en bruikbaarheidsnormen, afhankelijk van het voornaamste doel van het onderzoek. Beide redeneringen stellen *kwaliteit en impact als uitersten op een continuüm* waartussen onderzoekers een afweging moeten maken. Ook Andriessen (2014) en Cordingley (2008) stellen dat praktijkgerichte onderwijsonderzoekers afwegingen moeten maken tussen

kwaliteit en impact in de onderwijspraktijk, al komen zij allebei tot een andere vorm van samenhang. Andriessen beschouwt *kwaliteit en impact als twee dimensies* in een assenstelsel waardoor er een speelveld tussen beide ontstaat waarop praktijkgerichte onderwijsonderzoekers hun onderzoek kunnen positioneren. Anders dan het continuüm, sluiten kwaliteit en impact, of methodische grondigheid en praktische relevantie zoals hij het noemt, elkaar hierin niet uit als meer aandacht wordt besteed aan een van beide. Anders dan bij het ontbreken van samenhang lijken kwaliteit en impact als twee dimensies te veronderstellen dat er wel aandacht is voor beide en dat daar (bewust) keuzes in gemaakt kunnen worden. Cordingley beschouwt de kwaliteitsnormen uit de wetenschap als dominant in het maken van afwegingen tussen kwaliteit en impact waardoor *kwaliteit impact kan hinderen*. Vooral de normen voor wetenschappelijke publicaties bemoeilijken volgens haar aansluiting bij docenten en belemmeren daarmee impact in de onderwijspraktijk. Onderzoekers leggen te grote nadruk op generaliseren van kennis, terwijl docenten meer gebaat zijn bij kennis over wat heeft gewerkt, voor wie, onder welke omstandigheden en met welke effecten, zodat ze die kennis kunnen toepassen in hun eigen specifieke situatie (Edwards, 2000).

5.3 Onderzoeksvraag

De beschreven vormen van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek laten zien dat er verschillend tegen de samenhang tussen beide concepten aangekeken kan worden. Om deze en mogelijk ook andere vormen van samenhang verder te verkennen en beter te begrijpen zijn in een kwalitatief onderzoek zes Nederlandse praktijkgerichte onderwijsonderzoekers bevraagd op hun kijk op samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek. De centrale onderzoeksvraag in deze studie is:

> *Hoe verschillen perspectieven op de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek?*

Aangezien op voorhand al duidelijk is dat perspectieven op samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek sterk verweven zijn met onderliggende conceptualiseringen van kwaliteit en impact, is hier in het empirische gedeelte van dit onderzoek dan ook nadrukkelijk aandacht voor.

5.4 Methode

5.4.1 INFORMANTEN

De informanten zijn zes Nederlandse onderwijsonderzoekers: drie professoren, twee lectoren en een universitair hoofddocent, allen met bewezen expertise op het gebied van praktijkgericht onderwijsonderzoek. Allen hebben vaker over dit onderwerp gepubliceerd en zich gedurende langere tijd met dit soort onderzoek bezighouden als uitvoerder en/of begeleider. De informanten zijn doelbewust geselecteerd op basis van onderlinge verschillen in hun achtergronden om zo tot maximale variatie (Patton, 2002) in de verschillende perspectieven op de samenhang tussen kwaliteit en impact te komen. De informanten werken bij zes verschillende instituten en verschillen onder andere in het soort praktijkgericht onderwijsonderzoek waar zij zich voornamelijk mee bezig houden, bijvoorbeeld praktijkgericht onderwijsonderzoek door docenten of ontwerpgericht onderzoek. Het aantal van zes informanten lijkt passend voor een exploratieve studie die een eerste beeld moet geven van een nog weinig verkend onderwerp (Bogner & Menz, 2009).

5.4.2 DATACOLLECTIE

Datacollectie vond plaats door middel van zogenaamde exploratieve expertinterviews (Bogner & Menz, 2009). De onderzoekers zijn gevraagd naar hun kijk op de samenhang tussen kwaliteit en impact. Om te beginnen is deze vraag zo open mogelijk gesteld om de geïnterviewden ruimte te bieden vanuit hun eigen interpretatie te antwoorden en hun eigen perspectieven toe te lichten. De vraag was: Hoe kijkt u aan tegen de relatie tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek? Vervolgens zijn de vormen van samenhang uit de literatuur voorgelegd en is besproken hoe zij daar tegenaan kijken. Hierbij is ook telkens gevraagd naar de onderliggende conceptualiseringen van kwaliteit en impact als de informanten die uit zichzelf niet expliciet benoemden. De interviews duurden ongeveer één uur. Alle interviews zijn opgenomen en getranscribeerd.

Vervolgvragen verschilden per interview en waren afhankelijk van de respons van de geïnterviewden. Ook het groeiend inzicht van de interviewer en het gebruik van bevindingen uit eerdere interviews als input voor volgende interviews leverden verschillende accenten op. Deze manier van data verzamelen is passend voor het doel van exploratieve expertinterviews, namelijk het verkennen van het onderwerp van onderzoek. Het gaat er daarbij niet om te komen tot

datasaturatie en de interviews hoeven niet onderling vergelijkbaar te zijn (Bogner & Menz, 2009).

5.4.3 DATA-ANALYSE

Samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek was het centrale fenomeen in de data-analyse. De analyse volgde een *informed grounded theory* (Thornberg, 2012) strategie. Dit betekent dat de analyse niet enkel gegrond was in de data, maar dat de vormen van samenhang uit het theoretisch kader als *sensitising concepts* (Bowen, 2006) het uitgangspunt voor de analyse vormden. De *sensitising concepts* waren geen vastomlijnde en prescriptieve concepten, maar gaven richting aan de analyse in de vorm van denkkaders. Data werden gecategoriseerd volgens de *sensitising concepts* om vervolgens tot nieuwe invullingen van de concepten (d.w.z. vormen van samenhang), en eventuele aanvullende concepten, te komen.

Voor de analyse zijn eerst de afzonderlijke transcripten opgesplitst in coherente delen waarin een informant een samenhangende argumentatie geeft. De coherente delen zijn vervolgens samengevat en gecategoriseerd binnen de *sensitising concepts*, als een aanvullende vorm van samenhang of als invulling van kwaliteit of impact. Deze laatste categorie werd in de analyse meegenomen omdat uit de literatuurverkenning duidelijk werd dat de invullingen van kwaliteit en impact verweven zijn met percepties van samenhang. Op basis van deze eerste analysestap werd één aanvullende vorm van samenhang geïdentificeerd (zie Figuur 5.1).

Vervolgens zijn alle samenvattingen met dezelfde categorisering van alle informanten samengevoegd. Hierdoor werden de verschillende perspectieven op vormen van samenhang en de invullingen van kwaliteit en impact inzichtelijk. De uitkomst van deze tweede analysestap bestond uit een overzicht van de verschillende perspectieven op de vormen van samenhang.

Als laatste zijn de verschillende vormen van samenhang systematisch met elkaar vergeleken. Op basis hiervan werd duidelijk dat de perspectieven op de samenhang niet alleen verschillen op de invullingen van kwaliteit en impact, maar ook op twee andere aspecten.

De kwaliteit van de data-analyse is gecontroleerd door middel van een auditprocedure (Akkerman, Admiraal, Brekelmans & Oost, 2006; de Kleijn & van Leeuwen, 2018). Een summatieve audit is uitgevoerd door de derde auteur.

Hierbij zijn de data en de verschillende stappen van de data-analyse nagegaan en zijn de resultaten van het onderzoek (zoals beschreven in de volgende sectie) hieraan getoetst. Hij beoordeelde de procedure van de data-analyse als zichtbaar, begrijpelijk en acceptabel, en de bevindingen van de studie in lijn met de data.

5.5 Resultaten

5.5.1 PERSPECTIEVEN OP SAMENHANG

Een overzicht van de perspectieven van de geïnterviewde experts op vormen van samenhang tussen kwaliteit en impact is weergegeven in Tabel 5.1. In deze tabel staan de redeneringen van de experts wanneer een bepaalde vorm van samenhang wel of niet van toepassing kan zijn en waarom. Naast de vormen van samenhang uit het theoretisch kader bespreken zij een aanvullende vorm: wederzijdse beïnvloeding tussen kwaliteit en impact.

De centrale onderzoeksvraag in deze studie is hoe perspectieven op de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek verschillen. Perspectieven op de samenhang verschillen op drie aspecten. Ze verschillen op de invullingen van kwaliteit en impact, zoals ook bleek uit de literatuur. Daarnaast verschillen ze, zo komt uit de interviews naar voren, op de volgordelijkheid van kwaliteit en impact, en de werkelijkheid, aannemelijkheid en wenselijkheid van vormen van samenhang tussen kwaliteit en impact.

Tabel 5.1: Overzicht van de perspectieven van de geïnterviewde experts op de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek.

	Als…	**…dan…**	**…want…**
Geen samenhang tussen kwaliteit en impact	Als goede onderzoeken geen impact hebben en slechte onderzoeken wel impact hebben…	…dan lijkt er geen directe of voorspelbare samenhang tussen kwaliteit en impact te zijn…	…want er zijn factoren buiten een onderzoek die invloed hebben op het behalen van impact.
Impact als onderdeel van kwaliteit	Als kwaliteit gaat over zowel methodologische kwaliteit als ecologische kwaliteit of relevantie…	…dan is impact noodzakelijkerwijs onderdeel van kwaliteit…	…want ecologische kwaliteit of relevantie hangen inherent samen met impact.
	Als impact een indicator is van kwaliteit…	…dan is impact geen afhankelijke variabele van kwaliteit, maar zou wel iets kunnen zeggen over de gepercipieerde kwaliteit…	…want personen vinden een onderzoek dan blijkbaar goed genoeg om er iets mee te doen.
Gedeeltelijke conceptuele overlap tussen kwaliteit en impact	Als kwaliteit gaat over zowel methodologische kwaliteit als ecologische kwaliteit…	…dan heeft dat conceptuele overlap met impact…	…want ecologische kwaliteitsnormen als relevantie, herkenbaarheid, bruikbaarheid, generaliseerbaarheid, dialoog en pogingen tot impact dragen bij aan zowel kwaliteit als impact.
Kwaliteit als voorwaarde voor impact	Als kwaliteit gaat over methodologische kwaliteit…	…dan zou dat een voorwaarde voor impact in de praktijk moeten zijn…	…want dan zou alleen impact volgen uit goed onderzoek.
	Als kwaliteit gaat over methodologische kwaliteit…	…dan is dat een voorwaarde voor impact in de wetenschap…	…want anders komt een onderzoek niet door het peerreviewproces en wordt het niet gepubliceerd.
	Als kwaliteit gaat over ecologische kwaliteit…	…dan kan dat een voorwaarde zijn voor impact in de praktijk…	… want dan wordt een onderzoek afgestemd op de praktijk waardoor impact kan volgen.

Kwaliteit als facilitator voor impact	Als kwaliteit gaat over methodologische kwaliteit…	…dan kan dat impact in wetenschap en praktijk faciliteren…	…want dan kan het gepubliceerd worden waardoor een onderzoek publiciteit en autoriteit krijgt en impact kan ontstaan.
	Als kwaliteit over methodologische kwaliteit gaat…	…dan kan dat impact in de praktijk hinderen…	…want een onderzoek kan daardoor verder van de praktijk af komen te staan.
	Als kwaliteit gaat over ecologische kwaliteit…	…dan kan dat impact in de praktijk faciliteren…	…want dan wordt een onderzoek afgestemd op de praktijk waardoor impact kan volgen.
Kwaliteit en impact als uitersten van een continuüm	Als kwaliteit gaat over methodologische kwaliteit en impact over de praktische impact…	…dan kunnen dat de uitersten van een continuüm zijn…	…want methodologische kwaliteit en praktische impact kunnen elkaar uitsluiten.
	Als kwaliteit gaat over methodologische kwaliteit en ecologische kwaliteit…	…dan is een continuüm met impact onmogelijk…	…want impact is dan onderdeel van of heeft gedeeltelijke conceptuele overlap met kwaliteit waardoor ze elkaar niet uitsluiten.
	Als een onderzoek hoogt scoort op één van beide uitersten…	…dan is dat onwenselijk…	…want praktijkgericht onderwijsonderzoek heeft noodzakelijkerwijs zowel kwaliteit als impact anders is het ofwel geen onderzoek ofwel niet praktijkgericht.
Kwaliteit en impact als twee dimensies	Als kwaliteit en impact twee dimensies van een praktijkgericht onderwijsonderzoek zijn…	…dan zijn alle combinaties tussen beide mogelijk…	…want kwaliteit en impact sluiten elkaar dan niet uit.
	Als een onderzoek hoog scoort op één dimensie en laag scoort op de andere…	…dan is dat niet voldoende om iets een goed praktijkgericht onderwijsonderzoek te noemen…	…want daarvoor moet een onderzoek op beide dimensies goed scoren.
Kwaliteit hindert impact	Als kwaliteit gaat over methodologische kwaliteit…	…dan kan dat impact in de praktijk in de weg staan…	…want tijd die besteed wordt aan methodologische kwaliteit kan niet

			geïnvesteerd worden in het behalen van impact.
	Als kwaliteit gaat over publicatie-eisen…	…dan kan dat impact in de praktijk in de weg staan…	…want eisen aan wetenschappelijke publicaties kunnen herkenbaarheid voor docenten belemmeren.
	Als kwaliteit gaat over publicatie-eisen…	…dan staat dat impact in de praktijk niet per se in de weg…	…want publicatie zorgt voor publiciteit en autoriteit voor een onderzoek waardoor impact kan ontstaan.
Cyclische samenhang tussen kwaliteit en impact	Als er een cyclische samenhang is tussen kwaliteit en impact…	…dan draagt kwaliteit bij aan impact en impact aan kwaliteit…	…want ze versterken elkaar continu.

Opmerking: Een perspectief is gewoonlijk door meerdere informanten benoemd en één informant kan meerdere (tegenstrijdige) perspectieven benoemd hebben

5.5.2 INVULLINGEN VAN KWALITEIT EN IMPACT

De informanten benadrukken dat de invulling van kwaliteit bepalend is voor hoe de samenhang met impact er (mogelijk) uit ziet.

> ‘Alles heeft te maken natuurlijk met hoe je kwaliteit definieert. Voor sommige mensen is impact één aspect van kwaliteit. […] Maar er zijn ook andere aspecten van kwaliteit los van impact. […] Je hebt de methodologische kwaliteit, die kan ik zien als los van impact. Andere aspecten van kwaliteit die wat moeilijker zijn om los te trekken van impact, zijn bijvoorbeeld relevantie. Heb je te maken met een onderzoeksvraag die vanuit de praktijk onderzoekwaardig is, die vanuit de theorie onderzoekwaardig is? […] In elk geval de praktijkrelevantie is een aspect wat ik zou toerekenen tot, te maken kan hebben met, kwaliteit. En het kan ook direct invloed hebben op impact. Wetenschappelijke relevantie zou ook hetzelfde geval kunnen zijn als je praat over impact als […] de manier waarop wetenschappers en beleidsmakers met de inhouden omgaan. […] Het berust dus in de definities van kwaliteit en de definities van impact.’ (Informant E)

De invulling van kwaliteit behelst volgens alle informanten in ieder geval (a) methodologische kwaliteitsnormen. Daarnaast kunnen ofwel (b) impact ofwel (c) relevantie ofwel (d) ecologische kwaliteitsnormen onderdeel zijn van kwaliteit. Ieder van deze kan op verschillende wijzen ingevuld worden. Er is vanuit de informanten geen eenduidigheid over een eventuele prioritering tussen de verschillende kwaliteitsnormen. Impact, relevantie of ecologische kwaliteit kunnen ondergeschikt zijn aan methodologische kwaliteit, maar er kunnen ook in ieder onderzoek andere keuzes gemaakt worden of alle normen kunnen telkens als gelijkwaardig meegenomen worden. Daarnaast benoemen de informanten ook andere vormen van kwaliteit (i.e. ethische en democratische kwaliteitsnormen), maar die brengen ze niet in samenhang met impact. Bij (a) methodologische kwaliteitsnormen gaat het om normen voor goed onderzoek, dus om inherente kwaliteit van een onderzoek. De invulling van (b) impact behelst kennis-, product-, persoons- en/of systeemontwikkeling in de onderwijspraktijk of wetenschap. Die impact kan volgens de informanten direct voortvloeien uit een onderzoek of volgen uit het opbouwen van inzichten over meerdere onderzoeken en langere termijn. Daarnaast maken de informanten onderscheid tussen

wenselijke en onwenselijke impact, en tussen behaalde impact, potentiële impact en pogingen tot het behalen van impact. Met (c) relevantie verwijzen de informanten naar potentie voor impact in wetenschap of onderwijspraktijk, en met (d) ecologische kwaliteit naar normen die een onderwijsonderzoek praktijkgericht maken, zoals het betrekken van en het afstemmen met/op de praktijk. De informanten koppelen ecologische kwaliteit aan (potentiële en pogingen tot het behalen van) impact in de onderwijspraktijk. Het valt verder op dat de informanten op twee manieren omgaan met de invullingen van kwaliteit en impact. Ze kunnen vasthouden aan hun eigen invullingen en vervolgens vanuit dat perspectief vormen van samenhang bespreken, of ze kunnen een vorm van samenhang als uitgangspunt nemen en vanuit dat perspectief invulling geven aan kwaliteit en impact.

Als impact onderdeel is van kwaliteit kan impact volgens de informanten bijdragen aan of een indicator zijn voor kwaliteit. De invulling van impact kan dan ‘behaalde impact’ zijn, maar ook ‘potentiële impact’ of ‘pogingen tot het behalen van impact’. Bij een dergelijke invulling van impact kan er volgens de informanten ook sprake zijn van gedeeltelijke conceptuele overlap.

Bij een invulling van kwaliteit als methodologische kwaliteitsnormen in combinatie met relevantie en/of ecologische kwaliteitsnormen is er ook sprake van een gedeeltelijke conceptuele overlap tussen kwaliteit en impact. Volgens de informanten kunnen relevantie en/of ecologische kwaliteitsnormen namelijk wel bijdragen aan impact, maar methodologische kwaliteitsnormen niet. Om die reden dragen niet alle normen voor kwaliteit bij aan impact. De gedeeltelijke conceptuele overlap tussen kwaliteit en impact zit dan in de relevantie en ecologische kwaliteitsnormen, bijvoorbeeld in termen van herkenbaarheid, bruikbaarheid, generaliseerbaarheid, dialoog en pogingen tot impact, omdat die volgens de informanten bijdragen aan zowel kwaliteit als impact. Impliciet beperken de informanten zich hierbij tot impact in de onderwijspraktijk.

> ‘Ik denk dat er definities van kwaliteit en van impact zijn die eigenlijk inherent overlappen. Als het over relevantie en generaliseerbaarheid gaat.’ (Informant F)

Bij een beperkte invulling van kwaliteit als uitsluitend methodologische kwaliteit en bij een beperking van impact tot bijdragen aan de onderwijspraktijk kunnen naar het oordeel van de informanten kwaliteit en impact de uitersten van een

continuüm zijn. Als kwaliteit echter breder wordt opgevat en ook impact, relevantie en/of ecologische kwaliteit impliceert, dan zien de informanten een continuüm van kwaliteit en impact als onmogelijk doordat beide dan inherent met elkaar verbonden zijn en dus aan dezelfde kant van het continuüm komen te liggen.

> ‘Dat [continuüm] zou kunnen gaan kloppen als je hier van kwaliteit wetenschappelijke [methodologische] kwaliteit maakt, maar […] als je een traject hebt waarbij je hoog kwalitatief iets ontwerpt, bijvoorbeeld met de betrokkenheid van de doelgroep als medeontwerpers en je doet een of andere design thinking aanpak of zo, dan werk je tegelijkertijd ook aan een zo groot mogelijke impact. Dus dan liggen ze allebei aan dezelfde kant van het continuüm.’ (Informant D)

Bij een beperkte invulling van kwaliteit als enkel methodologische kwaliteit en een beperking van impact tot bijdragen aan de wetenschap kan kwaliteit een voorwaarde voor impact zijn. Zonder methodologische kwaliteit komt een onderzoek volgens de informanten niet in aanmerking voor publicatie en kan er geen bijdrage aan de wetenschap volgen. Bij een invulling van impact als bijdragen aan de onderwijspraktijk is methodologische kwaliteit niet voorwaardelijk, maar kunnen ecologische kwaliteit en/of relevantie dat wel zijn. Ecologische kwaliteit en relevantie dragen volgens de informanten bij aan het afstemmen van een praktijkgericht onderwijsonderzoek op de praktijk waardoor impact kan volgen. Methodologische kwaliteit kan impact in de onderwijspraktijk ook hinderen.

> ‘Als je je alleen maar richt op één vorm van kwaliteit [methodologische kwaliteit], dat kan inderdaad de praktijkimpact […] in de weg zitten.’ (Informant D)

Verschillende invullingen van kwaliteit en impact zijn mogelijk en beïnvloeden hoe de samenhang tussen beide concepten gezien wordt. Dat iedere praktijkgerichte onderwijsonderzoeker naar eigen inzicht invulling kan geven aan kwaliteit en impact zorgt er volgens de informanten voor dat er geen gedeeld beeld is hoe ze (mogelijk) met elkaar samenhangen. Een gedeeld beeld lijkt hen echter wel noodzakelijk, bijvoorbeeld als het aankomt op de subsidiëring van onderzoeksprojecten. Een gedeeld beeld kan bijdragen aan betere afstemming

tussen richtlijnen voor onderzoeksvoorstellen, interpretatie door onderzoekers en beoordeling door assessoren. Dat is prettig voor alle partijen: subsidieverstrekkers ontvangen aanvragen die beter aansluiten bij hun eisen, onderzoekers weten beter wat verwacht wordt van hun onderzoeksvoorstellen en assessoren hebben duidelijke richtlijnen voor het geven van feedback.

> ‘In situaties waarin mensen afhankelijk zijn, of in elk geval willen meewerken met gesubsidieerde projecten of projecten die anderen aangaan, dan is het gedeelde beeld van kwaliteit, impact, van relevantie, van doelen eigenlijk, essentieel. Als je dat voor jezelf wil doen dan heb je veel meer vrijheid om dat te bepalen.’ (Informant E)

5.5.3 VOLGORDELIJKHEID VAN KWALITEIT EN IMPACT: SEQUENTIEEL OF SIMULTAAN?

De samenhang verschilt ook naargelang ideeën over volgordelijkheid van kwaliteit en impact in een praktijkgericht onderwijsonderzoek. Kwaliteit en impact kunnen volgens de informanten sequentieel of simultaan meegenomen worden. Zowel kwaliteit als voorwaarde, facilitator of hinderend voor impact veronderstellen dat eerst kwaliteit en daarna pas impact aan bod komt in een praktijkgericht onderwijsonderzoek. De meeste informanten zien deze sequentie tussen kwaliteit en impact als onwenselijk en achterhaald. Zij vinden kwaliteit en impact van gelijkwaardig belang bij praktijkgericht onderwijsonderzoek en beide moeten dus gelijktijdig meegenomen worden in een onderzoeksproces.

> ‘Het suggereert een vervolgordelijkheid. Dat je eerst moet zorgen dat je onderzoeksmethoden op orde zijn en daarna iets met impact moet doen en impact eigenlijk dus pas gaat spelen als je goede onderzoeksmethoden hebt gedaan. Terwijl ik vind dat je in één afweging moet kijken. Als je onderzoek gaat doen moet je in één afweging zowel de praktijkverandering als de kwaliteit van de onderzoeksmethode meenemen.’ (Informant C)

Eén informant ziet een sequentie tussen kwaliteit en impact juist wel als wenselijk, passend bij zijn prioritering van methodologische kwaliteit boven relevantie waardoor methodologische kwaliteit altijd voorwaardelijk is voor impact in de wetenschap of praktijk.

> ‘Ik vind relevantie, voor de theorie of de praktijk, een criterium voor kwaliteit, en ik vind methodologisch deugen, zou je kunnen zeggen, een criterium voor kwaliteit. […] Of het methodologisch deugt, dat vind ik een voorwaarde voor allebei.’ (Informant A)

Waar kwaliteit als voorwaarde, facilitator of hinderend voor impact eenrichtingsverkeer van kwaliteit naar impact veronderstelt is het volgens de informanten ook mogelijk om het als tweerichtingsverkeer te zien. Kwaliteit kan dan niet alleen bijdragen aan impact, maar (aandacht voor) impact kan gelijktijdig bijdragen aan kwaliteit. Er ontstaat dan een wederzijdse beïnvloeding tussen kwaliteit en impact waarbij kwaliteit en impact simultaan aan de orde zijn in een praktijkgericht onderwijsonderzoek.

Percepties van de volgordelijkheid van kwaliteit en impact hebben volgens de informanten consequenties voor de uitvoering van praktijkgericht onderwijsonderzoek. Als kwaliteit en impact sequentieel aan bod komen, is het mogelijk om gedurende een onderzoeksproces de aandacht te richten op kwaliteit en achteraf pas aandacht te hebben voor impact. Door (aandacht voor) impact los te koppelen van het onderzoeksproces kunnen praktijkgerichte onderzoekers zich ook minder verantwoordelijk gaan voelen voor impact waardoor aandacht voor impact uitblijft. Als kwaliteit en impact echter simultaan aan de orde zijn dan zal voor beide aandacht moeten zijn gedurende het hele onderzoek.

> ‘Mijn hypothese is dat er best wel veel mensen zijn die zich niet verantwoordelijk voelen voor impact en wel voor de kwaliteit, dus die hebben dat over-de-schutting-gooien-gevoel van, ik doe mijn ding en iemand anders mag het balletje vervolgens oppakken. […] Terwijl bij praktijkgericht onderzoek vind ik het wel logischer dat degene die het onderzoek doet ook meer verantwoordelijkheid neemt voor het behalen van impact.’ (Informant E)

5.5.4 WERKELIJKHEID, AANNEMELIJKHEID EN WENSELIJKHEID VAN VORMEN VAN SAMENHANG

De perspectieven van samenhang tussen kwaliteit en impact die de informanten naar voren brengen zijn te typeren als werkelijk, aannemelijk of wenselijk. Het wordt als werkelijk ervaren dat er geen samenhang is tussen kwaliteit en impact doordat alle informanten voorbeelden kennen van goede onderzoeken zonder

impact en van slechte onderzoeken met impact. Het is volgens de informanten echter aannemelijk en wenselijk dat er wél samenhang is. Die samenhang is indirect en onvoorspelbaar doordat het behalen van impact ook samenhangt met factoren buiten een onderzoek of de mogelijkheden van een onderzoeker.

> ‘Er is natuurlijk heel veel goed onderzoek dat niet direct impact heeft, en ook slecht onderzoek dat geen niveau heeft. Ja, in al die kwadranten kun je natuurlijk allerlei voorbeelden vinden, dus in die zin denk ik wel dat er niet een heel directe samenhang is.’ (Informant F)

Het wordt volgens de informanten door veel praktijkgerichte onderwijsonderzoekers als werkelijkheid ervaren dat kwaliteit en impact elkaars tegenpolen zijn waartussen gekozen moet worden. De informanten denken echter dat kwaliteit en impact niet de uitersten van een continuüm zijn, maar juist synergie kunnen hebben. Ze beschouwen daarom het continuüm als een onwenselijke vorm van samenhang. Aandacht besteden aan één uiterste van het continuüm roept namelijk vragen op over de status (kwaliteit) en praktijkgerichtheid (impact) van een onderzoek. Volgens de informanten bevindt veel onderzoek zich in het midden van het continuüm om juist aan wensen voor zowel kwaliteit als impact tegemoet te komen.

> ‘Kijk, als een onderzoek heel veel impact heeft in de praktijk, maar het is op basis van gegevens die niet kloppen. […] Is het dan nog onderzoek? Moeten we dat nou willen? Ik denk dat je dat niet moet willen. […]. En als het wel kwaliteit heeft, maar absoluut geen impact dan vraag ik mij af, is het dan wel praktijkgericht? Misschien is hier [kwaliteit als uiterste] wel de vraag van, is het wel praktijkgericht? En is hier [impact als uiterste] de vraag van, is het wel onderzoek?’ (Informant B)

> ‘Ik denk wij als onderwijsonderzoekers eigenlijk vaak hier in het midden zitten. Omdat we zowel willen voldoen aan het ene criterium [kwaliteit] als aan het andere criterium [impact]. Negatief zou je dan kunnen zeggen van, het is vlees noch vis, maar positief zou je kunnen zeggen van, wij proberen twee grote eisen te combineren in één onderzoeksproject.’ (Informant C)

Een aannemelijkere vorm van samenhang is volgens de informanten het uitzetten van kwaliteit en impact als twee dimensies van praktijkgericht onderwijsonderzoek. Deze suggereert dat praktijkgerichte onderwijsonderzoekers telkens beide mee moeten nemen in hun onderzoeken. Alle combinaties tussen kwaliteit en impact zijn mogelijk en er lijkt voor praktijkgerichte onderwijsonderzoekers vrijheid om hun onderzoek overal op het speelveld tussen beide te positioneren. Dat betekent volgens de informanten echter niet dat alle posities eenvoudig te realiseren of wenselijk zijn. Hoog scoren op beide dimensies is moeilijk realiseerbaar en laag scoren op (één van) de dimensies wordt door de informanten gezien als onwenselijk. Eén informant concludeert dat het uitzetten van kwaliteit en impact als twee dimensies geen conceptuele samenhang hoeft te suggereren; het kunnen dan ook twee onafhankelijke concepten zijn.

Het wordt als aannemelijk beschouwd dat kwaliteit een facilitator voor impact is, maar die vorm van samenhang komt niet per se overeen met de door de informanten ervaren werkelijkheid. Methodologische kwaliteit kan impact in de wetenschap en de onderwijspraktijk faciliteren doordat het publicatie van een onderzoek mogelijk maakt. Door publicatie kan een onderzoek bekend raken en autoriteit krijgen waardoor impact kan ontstaan, maar impact kan ook uitblijven. Ook ecologische kwaliteit kan impact in de onderwijspraktijk faciliteren door aansluiting tussen een onderzoek en de onderwijspraktijk te bevorderen, maar impact kan ook hier uitblijven.

Het wordt door de informanten als wenselijk beschouwd dat kwaliteit een voorwaarde voor impact is. De informanten typeren dit als de ideale vorm van samenhang, want alleen goed onderzoek zou dan impact teweegbrengen. Tegelijkertijd komt deze vorm van samenhang niet overeen met de ervaren werkelijkheid van de informanten. Een van de informanten merkt op dat kwaliteit als voorwaarde voor impact sterk lijkt op kwaliteit als facilitator voor impact doordat bij beide vormen van samenhang kwaliteit bijdraagt aan impact. Het belangrijkste onderscheid tussen deze vormen van samenhang is volgens de informant dat er een drempelwaarde aan kwaliteit moet zijn als het voorwaardelijk is voor impact terwijl dat niet het geval hoeft te zijn als kwaliteit faciliterend is.

> ‘Die [kwaliteit als facilitator voor impact] en die [kwaliteit als voorwaarde voor impact] vind ik nog wel lastig uit elkaar te houden. […] Eigenlijk, wat je hier [bij kwaliteit als facilitator] zegt is van, hoe

> beter het onderzoek is hoe relevanter het wordt. En hier [bij kwaliteit als voorwaarde] kun je zeggen, hier zit een soort drempelwaarde aan. […] Ja, daar is allebei iets voor te zeggen, maar ik vind dat onderscheid heel moeilijk om te maken.' (Informant A)

Dat kwaliteit bijdraagt aan impact is volgens de informanten aannemelijk, maar alleen met een drempelwaarde aan kwaliteit zien ze het ook als wenselijk.

Hoe kwaliteit en impact met elkaar samenhangen, wat werkelijk, aannemelijk of wenselijk is, en welke consequenties dat heeft voor praktijkgericht onderwijsonderzoek en de kwaliteit en impact daarvan, zou volgens de informanten onderwerp van discussie moeten zijn tussen praktijkgerichte onderwijsonderzoekers. Deze discussie kan volgens hen uiteindelijk leiden tot veranderingen in begripsvorming van kwaliteit, impact en hun samenhang en vervolgens ook tot veranderingen in de uitvoering van praktijkgericht onderwijsonderzoek.

> 'Als we er bewust over nadenken hoe die twee met elkaar samenhangen, dat kan ons als onderwijsonderzoekers helpen om in dit soort [praktijkgerichte onderzoeks-] projecten ook de goede afwegingen, of in ieder geval belangrijke afwegingen, te maken. […] Dat je wel het gesprek erover met elkaar voert, misschien dat dat dan ook wel uiteindelijk dat discours beïnvloedt van: wat is goed onderzoek en wat is beter onderzoek? Dat debat zou eigenlijk ook tussen praktijkgerichte onderzoekers moeten spelen en dat zou ook wel moeten beïnvloeden van, hoe kunnen we nou de kwaliteit van dat onderzoek en de impact van dat onderzoek zo hoog mogelijk krijgen?' (Informant B)

Deze discussies zouden volgens een van de informanten ook aandacht moeten krijgen in opleidingen in de onderwijswetenschappen en professionaliseringstrajecten voor docentonderzoekers. Het uitvoeren van praktijkgericht onderwijsonderzoek en hoe daarbij aandacht te besteden aan het waarborgen van kwaliteit en impact vraagt volgens de informant om specifieke vaardigheden van onderzoekers die momenteel onvoldoende aandacht krijgen.

> ‘Ik denk dat als wij die kwaliteit met elkaar heel erg serieus nemen, dan denk ik ook dat we in onderwijs en opleiding en professionalisering dit misschien nog veel serieuzer zouden moeten nemen. Van, hoe kunnen we nou de kwaliteit van praktijkgericht onderwijsonderzoek echt omhoog krijgen? Dat is ook door heel erg serieus over deze vragen na te denken. En wat vraagt dat dan van mij? Ik moet goed onderzoek kunnen doen én ik moet in staat zijn om de vraagarticulatie te doen met relevante stakeholders én ik moet in staat zijn om de goede mensen te spreken én ik moet in staat zijn om na te denken over: welk type impact beoog ik en hoe kan ik daar gedurende het onderzoek met de relevante mensen op sturen? En ik moet in staat zijn om een degelijk wetenschappelijk artikel te schrijven én toegankelijk te maken voor de praktijk. […] Ik denk dat als je kwaliteit serieus neemt, dat dat dan in de opleiding nog meer aandacht zou mogen krijgen.’ (Informant B)

5.6 Conclusie en discussie

5.6.1 CONCLUSIE

Het doel van dit onderzoek was om de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek te verkennen en beter te begrijpen. Er wordt, zo blijkt, verschillend tegen de samenhang tussen kwaliteit en impact aangekeken. De resultaten van dit onderzoek laten zien waaruit die verschillen bestaan. Die verschillen lijken voornamelijk voort te komen uit de invullingen van kwaliteit en impact die als uitgangspunt genomen worden, uit ideeën over de volgordelijkheid van kwaliteit en impact, en de ervaren werkelijkheid, aannemelijkheid en wenselijkheid van bepaalde vormen van samenhang.

Verschillende invullingen van kwaliteit en impact zijn mogelijk. Met name de invulling van kwaliteit lijkt sterk verweven met hoe tegen de samenhang aangekeken wordt. Het valt hierbij op dat alleen methodologische en ecologische kwaliteitsnormen en relevantie meegenomen worden in redeneringen over de samenhang, terwijl de informanten rijkere invullingen van kwaliteit geven waarin tevens democratische en ethische kwaliteitsnormen meegenomen worden. De focus op methodologische en ecologische kwaliteit en relevantie als bepalend voor de samenhang tussen kwaliteit en impact kan voortkomen uit heersende

opvattingen dat praktijkgericht onderwijsonderzoek aan deze overkoepelende kwaliteitsnormen moet voldoen (bijv. Ros & Vermeulen, 2010; Verschuren, 2009). Het kan ook voortkomen uit de aansluiting van deze kwaliteitsnormen bij de definitie van praktijkgericht onderwijsonderzoek, namelijk wetenschappelijk onderzoek dat start vanuit een praktijkprobleem, wordt uitgevoerd in en met de praktijk, en voortbouwt op en beoogt bij te dragen aan de wetenschap en de onderwijspraktijk (NRO, 2020). Deze karakteristieken vragen om methodologische kwaliteit (wetenschappelijk onderzoek), ecologische kwaliteit (uitgevoerd in en met de praktijk) en relevantie (start vanuit een praktijkprobleem), want anders is het ofwel geen wetenschappelijk onderzoek ofwel niet praktijkgericht. De door de informanten gegeven invullingen van kwaliteit zijn dus niet geheel onverwacht en goed praktijkgericht onderwijsonderzoek (zoals gedefinieerd in deze studie) moet dus noodzakelijkerwijs voldoen aan normen voor methodologische en ecologische kwaliteit en relevantie. Een logisch gevolg van deze invulling van kwaliteit, en de nauwe verbondenheid van ecologische kwaliteit en relevantie met impact, is dat kwaliteit en impact op enige wijze met elkaar verbonden zouden moeten zijn en dat gebrek aan samenhang of onderlinge uitsluiting niet aan de orde zijn.

De invulling van impact wordt vrijwel altijd impliciet beperkt tot bijdragen aan de onderwijspraktijk. Als het gaat over bijdragen aan de wetenschap dan wordt dat expliciet benadrukt, maar deze vorm van impact komt veel minder aan bod. Deze vanzelfsprekendheid van praktische impact boven wetenschappelijke impact kan voortkomen uit de prioriteit die praktijkgerichte onderwijsonderzoekers vaak toekennen aan impact in de onderwijspraktijk (Van Braak & Vanderlinde, 2012) of uit heersende opvattingen dat de kloof tussen onderzoek en onderwijspraktijk kleiner moet en onderzoek meer moet bijdragen aan de onderwijspraktijk (Broekkamp & Van Hout-Wolters, 2007; Coonen & Nijssen, 2011). Het kan ook komen doordat de term ‘impact’ gewoonlijk gerelateerd wordt aan bijdragen aan de onderwijspraktijk; bijdragen aan de wetenschap wordt vreemd genoeg meestal niet als impact aangeduid. Een inperking van impact tot bijdragen aan de praktijk strookt echter niet met de tweeledige doelstelling van praktijkgericht onderwijsonderzoek om bij te dragen aan de onderwijspraktijk én de wetenschap. De resultaten van dit onderzoek laten zien dat de samenhang tussen kwaliteit en impact voor beide doelstellingen kan verschillen.

Ideeën over de volgordelijkheid of gelijktijdigheid van kwaliteit en impact in een praktijkgericht onderwijsonderzoek beïnvloeden welke vormen van samenhang als aannemelijk of wenselijk gezien worden. Voor beide opties zijn argumenten te geven, maar deze argumenten behoeven verdere uitdieping om discussies hierover scherper te kunnen voeren.

Verder valt op dat er verschillen bestaan tussen werkelijke, aannemelijke en wenselijke vormen van samenhang. Dit laat zien dat er ruimte bestaat tussen hoe de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek is en hoe die zou kunnen of moeten zijn. In de resultaten zien we bijvoorbeeld dat 'kwaliteit als voorwaarde voor impact' als een wenselijke vorm van samenhang benoemd wordt, terwijl een meerderheid van de informanten dit ook benoemt als een onwenselijke vorm van volgordelijk denken. Dit voorbeeld van tegenstrijdigheid in perspectieven laat zien dat de vorm van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek, en de wenselijkheid daarvan, niet eenduidig of evident is. Ook doen ideeën over wat (theoretisch gezien) mogelijk of wenselijk is niet altijd recht aan de complexiteit van de werkelijkheid waarin praktijkgericht onderwijsonderzoek wordt uitgevoerd. Bij het behalen van impact spelen, naast de kwaliteit van een onderzoek, ook andere factoren een rol, zoals contextkenmerken in wetenschap of praktijk, of overtuigingen, verwachtingen en interpretaties van beoogde gebruikers.

5.6.2 DISCUSSIE

In de weergave van de resultaten pogen wij de diversiteit aan perspectieven weer te geven, want juist in die diversiteit schuilen mogelijkheden om van elkaar te leren (Moss et al., 2009). De resultaten zouden hun rijkheid en daarmee hun toegevoegde waarde verliezen als we proberen de verschillende perspectieven te verenigen of proberen tot overeenstemming te komen over dé vorm van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek. Bovendien was het komen tot overeenstemming niet het doel van dit onderzoek, maar juist het uitdiepen door de verscheidenheid aan perspectieven te verkennen en zo ons begrip van de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek te vergroten. Zonder een eenduidig of definitief antwoord te kunnen en willen geven op de vraag hoe kwaliteit en impact van praktijkgericht onderwijsonderzoek samenhangen willen wij op basis van de bevindingen van dit onderzoek en de vooropgestelde definitie van praktijkgericht

onderwijsonderzoek, drie punten benadrukken die aandacht verdienen in discussies over samenhang tussen kwaliteit en impact.

Ten eerste is bijdragen aan onderwijspraktijk én wetenschap (of in ieder geval het streven daartoe) de essentie van praktijkgericht onderwijsonderzoek zoals het in deze studie en landelijk door NRO gedefinieerd wordt. Door de veelal exclusieve focus op impact in de onderwijspraktijk kan de even belangrijke impact in de wetenschap uit het vizier raken. Aandacht houden voor beide is echter wenselijk, niet in de laatste plaats omdat impact in de praktijk impact in de wetenschap zou kunnen versterken en vice versa. Bijvoorbeeld, onderzoeken met impact in de praktijk kunnen interessant zijn voor andere onderzoekers die ook dergelijke impact nastreven, en impact in de wetenschap kan docenten vertrouwen geven in de resultaten van een onderzoek waardoor zij eerder geneigd zijn ermee aan de slag te gaan (Edwards, 2000; Feldman, 2007).

Ten tweede zijn kwaliteit en impact beide van belang. Zonder kwaliteit is het namelijk maar de vraag of het wel onderzoek genoemd mag worden en zonder (streven naar) impact in de praktijk valt de praktijkgerichtheid te betwijfelen. Hierbij lijkt het ook wenselijk dat kwaliteit en impact beide in het vizier blijven gedurende een onderzoeksproces. In veel voorwaarden voor subsidiëring van praktijkgericht onderwijsonderzoek wordt hier bijvoorbeeld al om gevraagd. Waar impact eerder op de tweede plaats kwam in onderzoeksvoorstellen en bij de uitvoering van een onderzoek pas aan het einde aan bod kwam, moet er nu vaak al vanaf de start, net als voor kwaliteit, aandacht zijn voor impact, bijvoorbeeld door (verplichte) samenwerking binnen consortia van onderzoekers en practici vanaf de opzet van onderzoeksvoorstellen. Ondanks de wenselijkheid van aandacht voor zowel kwaliteit als impact kan het echter onoverkomelijk zijn dat er soms concessies gedaan moeten worden aan (een van) beide, bijvoorbeeld omdat randvoorwaarden bij een onderzoek (i.e. tijd, geld, mogelijkheden) daartoe dwingen.

Ten derde speelt normativiteit een belangrijke rol. De ideeën van praktijkgerichte onderwijsonderzoekers – bijvoorbeeld wat betreft de invullingen van kwaliteit en impact, en hun respectievelijke plaatsen in een onderzoek – hangen samen met hoe zij samenhang percipiëren en wat zij als aannemelijk of wenselijk beschouwen. Discussies over samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek zijn gebaat bij explicitering van onderliggende

normen en opvattingen om onderlinge verschillen inzichtelijk en begrijpelijk te maken.

5.6.3 BEPERKINGEN

Deze studie gaat uit van een bepaalde definitie van praktijkgericht onderwijsonderzoek en dat heeft consequenties voor de bevindingen. Andere definities van praktijkgericht onderwijsonderzoek zijn denkbaar en in gebruik, en leiden mogelijk tot andere resultaten.

Daarnaast kiezen we er in deze studie voor percepties van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek als uitgangspunt te nemen. We zijn ons ervan bewust dat het ook mogelijk is om ideeën over samenhang af te leiden uit opvattingen over kwaliteit en impact. Er zijn echter invullingen van kwaliteit en impact mogelijk die haaks op elkaar staan en die het voor praktijkgerichte onderwijsonderzoekers (onnodig) moeilijk maken om zowel kwaliteit als impact te realiseren. Door beide concepten vanuit hun onderlinge samenhang in te vullen kan naar verwachting een rijker, en mogelijk productiever, beeld ontstaan.

Als uitgangspunt voor deze studie namen we vormen van samenhang beschreven in de literatuur. De alternatieve vorm van samenhang (i.e. wederzijdse beïnvloeding van kwaliteit en impact) die de informanten benoemen laat zien dat het overzicht aan vormen onvolledig was. Ook andere vormen van samenhang zijn denkbaar, zoals impact als voorwaarde of hindernis voor kwaliteit, maar blijven in dit onderzoek onbenoemd. Daarnaast hebben we een beperkt aantal van zes onderwijsonderzoekers als experts geïnterviewd. Deze studie moet dan ook gezien worden als een eerste empirische verkenning van dit complexe onderwerp. Verder onderzoek met een groter aantal experts of met experts in andere rollen, zoals docenten, docentonderzoekers of beleidsmakers, zou het geschetste beeld verder kunnen verrijken.

5.6.4 IMPLICATIES

De mogelijke manieren van samenhang tussen kwaliteit en impact krijgen weinig expliciete aandacht in discussies over praktijkgericht onderwijsonderzoek. Dit onderzoek laat zien dat aandacht daarvoor wel nodig is, want hoe de samenhang tussen kwaliteit en impact gepercipieerd wordt heeft consequenties voor verschillende aspecten van praktijkgericht onderwijsonderzoek en daarmee ook voor de betrokken partijen, zoals onderzoekers, practici en beleidsmakers.

Om te beginnen hebben perspectieven op samenhang tussen kwaliteit en impact invloed op de opzet en uitvoering van praktijkgericht onderwijsonderzoek. Als sequentiële aandacht voor kwaliteit en impact onwenselijk geacht wordt, dan zal er in het hele proces van onderzoeksplan tot rapportage en disseminatie continu simultaan aandacht voor beide moeten zijn. Dit betekent dat (aandacht voor) impact, net als (aandacht voor) kwaliteit, niet alleen aan het einde een rol moet spelen, maar vanaf het begin integraal meegenomen moet worden in de opzet en uitvoering van praktijkgericht onderwijsonderzoek. Dit kan bijvoorbeeld door in de opzet van een onderzoek de beoogde impact en plannen voor realisatie te expliciteren. Daarnaast zal in de rapportage van een praktijkgericht onderwijsonderzoek, naast aandacht voor verantwoording van de kwaliteit, ook aandacht moeten zijn voor verantwoording van de impact. Gezien de tweeledige doelstelling van praktijkgericht onderwijsonderzoek geldt dit voor zowel impact in de onderwijspraktijk als impact in de wetenschap en is aandacht voor beide gewenst.

Verder kunnen perspectieven op samenhang tussen kwaliteit en impact gevolgen hebben voor de financiering van praktijkgericht onderwijsonderzoek. Afhankelijk van het perspectief kan kwaliteit of impact prioriteit krijgen of zal er meer aandacht voor methodologische kwaliteit of juist voor ecologische kwaliteit of relevantie moeten zijn. Dit kan bijvoorbeeld gevolgen hebben voor de (prioritering van) beoordelingscriteria voor onderzoeksvoorstellen, maar ook voor het soort onderzoeksopzet dat hierbij aansluit. Aangezien perspectieven op samenhang tussen kwaliteit en impact sterk kunnen verschillen, is het de vraag of het mogelijk is te komen tot een breed gedragen consensus over de gevolgen voor de financiering van praktijkgericht onderwijsonderzoek. Onze verwachting is dat discussie hierover, mede op basis van de bevindingen van dit onderzoek, kan bijdragen aan verheldering van de verschillende perspectieven en daarmee wederzijds begrip kan vergroten.

Een ander punt van aandacht is de opleiding van onderwijsonderzoekers. In huidige opleidingsprogramma's voor masterstudenten, promovendi en docentonderzoekers lijkt de aandacht veelal uit te gaan naar het leren (toepassen) van onderzoeksmethoden. Als een meerderheid van de personen die uiteindelijk in het onderzoeksveld terecht komt echter praktijkgericht onderwijsonderzoek gaat uitvoeren (zoals volgens het onderzoek van van Braak en Vanderlinde uit 2012 het geval is), dan zou in opleidingsprogramma's meer

aandacht voor de specifieke uitdagingen van praktijkgericht onderwijsonderzoek gepast zijn. Praktijkgericht onderwijsonderzoek vraagt bijvoorbeeld, naast aandacht voor methodologische kwaliteit, ook aandacht voor ecologische kwaliteit. Het afstemmen van onderzoek op, samenwerken met en bijdragen aan de onderwijspraktijk zou bijzondere aandacht in de opleiding verdienen, zeker als we de tweevoudig doelstelling van praktijkgericht onderwijsonderzoek om bij te dragen aan de wetenschap én onderwijspraktijk serieus nemen. Verder onderzoek is nodig naar hoe aandacht voor de uitdagingen van praktijkgericht onderwijsonderzoek in opleidingen geïntegreerd kan worden.

Voor de gemeenschap van praktijkgerichte onderwijsonderzoekers, maar ook voor individuele onderzoekers, lijkt aandacht voor samenhang tussen kwaliteit en impact gewenst aangezien de verschillende perspectieven gevolgen kunnen hebben voor vele aspecten van hun onderzoekspraktijk. De verwachting is dat perspectieven niet alleen tussen personen, maar ook per individu per onderzoeksproject kunnen verschillen. Individuele onderzoekers kunnen in verschillende onderzoeksprojecten verschillend naar de samenhang tussen kwaliteit en impact kijken, bijvoorbeeld afhankelijk van verschillende doelstellingen of randvoorwaarden en daarmee samengaande prioriteiten voor kwaliteit of impact. Eenmalige discussies of individuele overwegingen, of zoeken naar consensus kan hier dus geen uitkomst bieden. Doorlopende discussies of individuele overwegingen zullen nodig zijn om als onderzoeker(s) helderheid te verkrijgen en behouden over samenhang tussen kwaliteit en impact en de gevolgen daarvan voor praktijkgericht onderwijsonderzoek. Deze kunnen bijvoorbeeld bijdragen aan beargumenteerde keuzes wat betreft methodologie, betrekken van belanghebbende partijen of media voor publicatie. Betrokkenheid van de onderwijspraktijk bij deze discussies is wenselijk aangezien impact van praktijkgericht onderwijsonderzoek ook beoogd is voor deze doelgroep. Daarbij hebben professionals in de onderwijspraktijk hun eigen perspectieven op kwaliteit van praktijkgericht onderwijsonderzoek (Groothuijsen et al., 2020), en mogelijk ook op gewenste impact en de samenhang tussen beide. Dat deze perspectieven (mogelijk) afwijken van perspectieven van wetenschappers maakt ze waardevol om bestaande ideeën te verrijken.

Dit onderzoek laat zien dat heldere en scherpe discussies over samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek gebaat zijn bij explicitering van onderliggende ideeën over de invullingen van kwaliteit en impact

en hun volgordelijkheid, en of werkelijke, aannemelijke of wenselijke scenario's het uitgangspunt vormen. Veel verwarring over samenhang tussen kwaliteit en impact lijkt namelijk voort te komen uit onduidelijkheid over deze punten. Bovendien laat dit onderzoek zien dat er spanning bestaat tussen de werkelijke (ervaren) situatie en wat praktijkgerichte onderwijsonderzoekers zouden willen of denken te moeten doen in praktijkgericht onderwijsonderzoek wat betreft kwaliteit en impact. Heldere en scherpe discussies, mede gevoed door de resultaten van dit onderzoek, kunnen bijdragen aan het nastreven van optimalisatie van kwaliteit en impact van praktijkgericht onderwijsonderzoek.

6. GENERAL CONCLUSIONS & DISCUSSION

6.1 Main findings and conclusions

6.1.1 INTRODUCTION

The aim of this dissertation is to address quality and impact of practice-oriented educational research as bifaceted in order (i) to increase conceptual understanding of the quality and impact of practice-oriented educational research as well as their interrelatedness, and (ii) to identify how quality, impact and their interrelatedness can correspondingly be actualised. Four studies on quality, impact, and their interrelatedness were conducted in order to answer the following overall research question:

> *How can the quality and impact of practice-oriented educational research and their interrelatedness be conceptualised and actualised?*

The answer to this research question is intended to inform understandings of and discussions on quality and impact of practice-oriented educational research and their interrelatedness, thereby striving to contribute to realising the full potential of practice-oriented educational research. The presented studies show that underlying assumptions, choices, norms, and values are reflected in how quality, impact and their interrelatedness are conceptualised. Conceptualisations of quality (Chapter 2) reflect underlying quality concerns, differentiation or alignment of research- and practice-focussed concerns, and interpretation of practice-oriented educational research as a research approach or as a research process or product. Conceptualisations of impact (Chapter 3) differ in terms of scope, nature and progress. Conceptualisations of the interrelatedness of quality and impact (Chapter 5) reflect underlying interpretations of quality and impact, ideas about their sequence, and the perceived reality, plausibility, and desirability of forms of interrelatedness. In actualising quality and impact of practice-oriented educational research and their interrelatedness, it seems imperative to explicate the underlying assumptions, choices, norms, and values that affect their conceptualisations. Furthermore, it is found that practice-oriented educational research studies can be designed to actualise impact in particular (Chapter 4). In the following paragraphs these findings are further elaborated.

6.1.2 QUALITY OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

The study presented in Chapter 2 identified teacher-researchers' perspectives on the quality of practice-oriented educational research and analysed how these

differ from research perspectives found in the literature. Analysis revealed three noteworthy differences between the conceptualisations of the quality of practice-oriented educational research.

First, the quality concerns from the teacher-researchers' perspectives do not fully correspond with the quality concerns from research perspectives distilled from the literature. Although some quality concerns from the teacher-researchers' perspectives and the literature show conceptual alignment (i.e., truth value, applicability, consistency, neutrality, and cumulativity), other quality concerns are only present in the teacher-researchers' perspectives (i.e., recognisability and effectivity) or in the literature (i.e., comprehensibility, acceptability, usability, value for learning, and economic value). Differences in quality concerns seem to originate from different assumptions underlying both perspectives. The quality concerns only present in the teacher-researchers' perspective reflect their assumption that quality is determined by the intended audience (i.e., teachers). Therefore, practice-oriented educational research should convince teachers of its quality by being recognisable for teachers and showing an effective contribution to educational practice. The quality concerns only present in the literature reflect the assumption that quality is inherent to practice-oriented educational research, in the sense that the research should be comprehensible, acceptable, and usable for teachers, and have value for learning and economic value. These quality concerns are assumed to be objective and independent of teachers' perceptions. These two differing elaborations of quality correspond with distinctions between 'quality in use' and 'internal quality' common in the field of software design (Bevan, 1999).

Second, the teacher-researchers do not explicitly distinguish between research- and practice-focussed quality concerns. The explicit distinction between research- and practice-focussed quality concerns in the literature reflects the underlying assumption that the quality concerns should align with the twofold purpose of practice-oriented educational research to contribute to both educational research and practice. In line with this explicit distinction, the quality concerns expressed in the literature differ for both intended purposes. Most of the teacher-researchers' quality concerns for research and practice align (i.e., applicability, consistency, and cumulativity in research and practice), reflecting their assumption that similar quality concerns should apply for both intended purposes. This could indicate correspondence between the two aims of practice-

oriented educational research, but does not necessarily imply impact as bifaceted (as discussed in paragraph 6.2.2.).

Third, the teacher-researchers address the quality of aspects of practice-oriented educational research (i.e., intervention, method, or results), whereas the quality concerns in the literature typically address practice-oriented educational research as a whole. A notable exception regarding the latter are the quality criteria for interventions in educational design research discerned by Nieveen (1999). The different foci on aspects of research or research as a whole reflect differing perspectives on the nature of practice-oriented research. The teachers-researchers regard practice-oriented educational research as a process or product, whereas in the literature it seems to be regarded as a research approach.

In current discussions on quality of practice-oriented educational research, quality concerns are paramount (cf. Hammersley, 2007, 2008). Based on the findings of the study in Chapter 2, we contend that the underlying assumptions, leading to conceptualisations of quality and corresponding quality concerns, deserve similar attention as these can enrich and clarify discussions of quality in general and quality concerns in particular.

In line with these findings, it seems essential to explicate how quality is conceptualised and consequently operationalised in quality concerns to actualise practice-oriented educational research with quality, for example when conducting a study or when assessing the quality of a research proposal or manuscript. This offers stakeholders the opportunity to comply with an applicable conceptualisation or to have clear and focussed discussions about it.

6.1.3 IMPACT OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

The study presented in Chapter 3 established a conceptualisation of the impact of practice-oriented educational research in three dimensions: scope implies the targets of change, nature indicates the kind of change, and progress signifies the course of change over time. If and how these dimensions are elaborated can differ and reflects underlying ideas on the dimensions of impact and the impact to be included. For example, if scope of change should be included and whether it should include impact in educational practice, research or both, if the nature of change should be included and whether it should encompass cognitive, instrumental, symbolic or all changes, or if the course of change over time should

be included and whether it should contain initial or sustainable impact or shifting impact over time. Current conceptualisations of impact in the literature tend to be one-dimensional, i.e., limited to scope or nature of impact (e.g., Frost & Durrant, 2002; Tseng, 2012; Cain, 2015), or normative, i.e., focussing on level or extent of impact (e.g., Dagenais et al., 2012). The results of Chapter 3 illustrate the value of conceptualising impact in three dimensions without a priori normative judgements.

A clear conceptualisation of impact seems imperative for effective actualisation of the impact of practice-oriented educational research in educational research and practice. The conceptual framework of impact presented in Chapter 3 can support practice-oriented educational researchers and other stakeholders to realise the impact of a study by enabling the indication of intended and/or achieved impact in a structured and concise way. The strength of the presented conceptualisation of impact in the three dimensions scope, nature and progress is that it offers the opportunity to address and discuss impact without subjective or normative statements. It is also non-prescriptive in what impact to achieve, what impact to prioritise or how to achieve impact. By highlighting the dimensions of impact, the conceptual framework offers the liberty to imagine or identify the full range of impact without impediments.

6.1.4 DESIGNING PRACTICE-ORIENTED EDUCATIONAL RESEARCH STUDIES FOR IMPACT

The study presented in Chapter 4 identified how the characteristics of practice-oriented educational research contribute to actualising impact. Following our definition of practice-oriented educational research, it has four characteristics that are expected to contribute to the achievement of impact. It (1) emanates from an issue in educational practice, (2) is conducted in ‘real’ educational practice contexts (3) with collaborative involvement of relevant stakeholders (i.e., researchers and teachers), and (4) builds on and aims to contribute to educational research and practice. The results show that already in the design of a practice-oriented educational research study, the actualisation of impact in the local school context can be anticipated. The results do not show whether in the design of a study the actualisation of impact in the local university context can be anticipated.

Concerning the scope of impact, the issue of research, and how it is established, seems paramount. The actualised scope reflects the subject matter or actors the

study focusses on, and stakeholders involved in establishing the issue of research are more likely to report impact. In designing for impact, the findings of Chapter 4 suggest the selection of an issue of research that addresses a local need, preferably in collaboration with local stakeholders. The nature of impact reflects the nature of the involvement of stakeholders in a study. More substantive involvement of stakeholders leads to more substantive changes, meaning that achieved impact moves beyond conceptual to instrumental changes. In designing for impact, deliberation on the nature of involvement of local stakeholders in all phases and aspects of the study is suggested. The progress of impact could not be directly linked to the defining characteristics of practice-oriented educational research. However, reification of (parts of) the research, such as underlying ideas, interventions, or findings, seems indispensable to achieve sustainable changes. In designing a practice-oriented educational research study, materialisation is therefore advised. Another aspect of the progress of impact is that, over time, impact can shift beyond the research in meaningful ways. Consideration of potential shifts of impact in the design of a study seems warranted.

6.1.5 INTERRELATEDNESS OF QUALITY AND IMPACT OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

The study presented in Chapter 5 explored perspectives on the interrelatedness of quality and impact of practice-oriented educational research. The interrelatedness of quality and impact of practice-oriented educational research can be conceptualised in different ways, evident from the multiple forms of interrelatedness in the literature and the diverse perspectives identified in the study. Differences in perspectives on the interrelatedness of quality and impact reflect three underlying issues.

First, perspectives of interrelatedness intertwine with underlying conceptualisations of quality and impact. Quality is typically associated with methodological quality concerns, ecological quality concerns, and relevance. This interpretation of quality aligns with the characteristics of practice-oriented educational research as scientific research (methodological quality) emanating from an issue in educational practice (relevance), being conducted in ‘real’ educational practice contexts with collaborative involvement of relevant stakeholders (ecological quality), and building on and aiming to contribute to educational research and practice. The latter characteristic (aiming to contribute

to educational research and practice) emphasises the twofold aim of practice-oriented educational research, but interpretations of impact are often limited to educational practice. Second, perspectives on the interrelatedness reflect ideas about the sequence of quality and impact. In practice-oriented educational research studies, quality and impact can be addressed simultaneously or sequentially. Ideas about this sequence affect which forms of interrelatedness are considered appropriate. Third, perspectives on the interrelatedness of quality and impact in practice-oriented educational research differ in terms of reality, plausibility, or desirability. Some forms of interrelatedness are experienced as current reality, while other forms are perceived as plausible or desirable, indicating differences between how the interrelatedness of quality and impact is and how it can or should be.

In actualising quality and impact of practice-oriented educational research, it seems indispensable to explicate underlying perspectives on their interrelatedness, as these can have consequences for the design, effectuation, assessment and financing of practice-oriented educational research studies. How the interrelatedness of quality and impact is perceived affects if and when quality and impact are to be considered and addressed in a practice-oriented educational research study.

6.2 Reflection on findings and underpinning assumptions

6.2.1 REFLECTION ON MAIN FINDINGS AND CONCLUSIONS

The main findings of this dissertation are the underlying issues reflected in conceptualisations of quality and impact of practice-oriented educational research as well as their interrelatedness. In current discussions on quality, impact and their interrelatedness, conceptualisations and underlying issues mostly remain implicit, resulting in vague conceptualisations (cf. Blikstad-Balas, 2014). This vagueness consequently impedes productive discussions towards the actualisation of practice-oriented educational research with quality and impact. This dissertation emphasises the importance of clear and focussed discussions in which explicit conceptualisations of quality, impact and their interrelatedness are substantiated with explications of underlying assumptions, choices, norms and values. We want to emphasise that continuous discussions on quality and impact of practice-oriented educational research and their

interrelatedness among practice-oriented educational researchers and other stakeholders (e.g., teachers, school leaders, policymakers, subsidy agents) are vital to realise the full potential of practice-oriented educational research.

Further findings indicate how the realisation of impact in educational practice can be anticipated in the design of practice-oriented educational research studies. That studies can be designed for impact is often assumed. NRO, for example, requires collaboration between researchers and practitioners in calls for practice-oriented educational research proposals. This dissertation highlights how this collaboration can be designed to foster impact. Other factors beyond a study and a researcher's influence can hinder or inhibit impact. However, this does not dismiss a researchers' responsibility to strive for impact. Without regard for impact in the design of a study, the realisation of impact is placed beyond the confines of a study and the responsibility of a researcher. By emphasising impact in the design of a study, a researcher can anticipate its achievement. This can increase the potential for impact, even though there is no guarantee of success.

6.2.2 REFLECTION ON THE CHARACTERISATION OF PRACTICE-ORIENTED EDUCATIONAL RESEARCH

In this dissertation, in line with definitions in use in the literature and by NRO, practice-oriented educational research is consistently characterised as scientific research emanating from an issue in educational practice, being conducted in 'real' educational practice contexts with collaborative involvement of relevant stakeholders (i.e., researchers and teachers), and building on and aiming to contribute to both educational practice and research. This characterisation aligns with the main premise of this dissertation, namely that quality and impact should be understood and addressed as bifaceted. Other characterisations of practice-oriented educational research are possible and in use (e.g., as non-scientific, or with the singular aim to contribute to educational practice), potentially yielding other understandings of quality and impact. In line with the characterisation of practice-oriented educational research current in this dissertation, conceptualisations of quality from teacher-researchers' perspectives were identified alongside existing conceptualisations from the research perspective in the literature (Chapter 2), and impact was conceptualised (Chapter 3) and analysed (Chapter 4) for both educational practice and research.

Concerning the quality of practice-oriented educational research, it had previously been established that conceptualisations of quality should align with

the twofold aim to contribute to educational practice and research (Anderson & Herr, 1999; Oancea & Furlong, 2007; Newton & Burgess, 2008; Verschuren, 2009; Ros & Vermeulen, 2010; van Veen, 2012; Akkerman, Bronkhorst, & Zitter, 2013; Oolbekkink-Marchand, van der Steen, & Nijveldt, 2014; Heikkinen, de Jong, & Vanderlinde, 2016). We expanded this notion by arguing that quality should additionally be conceptualised from the perspectives of the two target audiences of practice-oriented educational research, namely researchers and teachers. However, the findings of Chapter 2 show that quality is not necessarily understood as a bifaceted concept. The conceptualisation of quality from the teacher-researchers' perspectives shows that some quality concerns for educational research and practice are similar in nature. Moreover, there seems to be merit in aligning the quality concerns for both aims because it accentuates the alignment of both aims and indicates that they are not necessarily competitive. Striving to achieve the twofold aim of practice-oriented educational research would not necessarily require separate considerations and actions but could be integrated and striven for simultaneously. Nevertheless, the notion that quality of practice-oriented educational research should be addressed from the perspectives of both its target audiences remains valid as long as conceptualisations of quality from the practice and research perspectives differ.

Concerning the impact of practice-oriented educational research, impact in educational practice and research are typically unequally conceptualised and unevenly addressed. Impact in educational practice mainly focusses on individual and community levels (e.g., Henson, 2001; Frost & Durrant, 2002; Campbell & Jacques, 2004; Snoek & Moens, 2011; Vrijnsen-de Corte, den Brok, Kamp, & Bergen, 2013; Zwart, Smit, & Admiraal, 2015; Bakx, Bakker, Koopman, & Beijaard, 2016; Hilton & Hilton, 2017; Dunn, Hattie, & Bowles, 2018) whereas impact in educational research mainly focusses on a general level through knowledge development (e.g., Frost & Durrant, 2002; Meijer, Oolbekkink, Meirink, & Lockhorst, 2013; Zwart, Smit, & Admiraal, 2015; Admiraal, Buijs, Claessens, Honing, & Kardijk, 2017) or citation scores (e.g., EERQI, 2011). Moreover, impact in educational practice is predominantly considered in public discourse. Impact in educational research is addressed considerably less and typically not referred to as impact but as a contribution to scientific knowledge. By establishing impact as a bifaceted concept it was assumed that impact in educational practice and research can be conceptualised similarly. The results of Chapter 3 show that by explicating the scope, nature and progress of impact

similarly for both aims, impact in educational practice and research that previously remained underexposed comes on a par with the more prominent and most considered forms of impact. Analysis of achieved impact in educational practice and research (Chapter 4) articulates the diversity and complementary value of both facets of impact and shows that less typical impact is achievable and valuable for both research and practice. This highlights the value of conceptualising and addressing both facets of impact similarly and more evenly, even though aspired impact in educational practice and research mostly differs.

Overall, we contend that there is value in conceptualising quality and impact as bifaceted based on the twofold aim of practice-oriented educational research. Limiting the understanding of quality and impact of practice-oriented educational research to either one of the facets has hitherto led to omissions in the conceptualisations of quality and impact, limiting understanding of these two concepts as described above. Quality concerns on recognisability and effectiveness, and elaborations of concerns for consistency and cumulativity in educational practice in addition to educational research would have been missed, and impact on educational research, other than contributions to knowledge, would have remained invisible. The perspectives of the two target audiences on quality are complementary and together they result in a richer conceptualisation of the quality of practice-oriented educational research. Moreover, these diverse perspectives increase understanding of the scepticism regarding the quality of practice-oriented educational research. Doubts about quality were so far attributed to the use of research methods that differed from traditionally used methods and lack of compliance with traditional understandings of quality (Lagemann & Shulman, 1999). By approaching quality of practice-oriented educational research from the perspectives of both target audiences, we conclude that doubts about quality can additionally result from alternative conceptualisations of quality in which regard for impact in educational practice plays a pivotal role. Similarly, doubts about the impact of practice-oriented educational research were hitherto attributed to limited achievements of impact (e.g., Burkhardt & Schoenfeld, 2003; Levin, 2004; Anderson & Shattuck, 2012; Dagenais et al., 2012). However, they can also be attributed to limited perceptions of the achieved impact of practice-oriented educational research due to limited conceptualisations of what impact is or could be by excluding valuable impact on individuals and communities in educational research. With the bifaceted conceptualisation of impact, based on the twofold aim of practice-

oriented educational research, more inclusive and more comprehensive views of achieved impact are obtainable, potentially rendering existing critiques of the impact of practice-oriented educational research invalid.

By posing quality and impact as bifaceted concepts in line with the twofold aim of practice-oriented educational research, perspectives of other stakeholders in practice-oriented educational research (e.g., policymakers, subsidy providers) on quality, and impact beyond educational practice and research (e.g., policy, society, public debate) are not considered. Due to this limitation, alternative conceptualisations of quality and impact remain unexposed. This limitation was deliberately included in the design of this study to focus on the, in our perception, two main facets and to limit the extent of the research. Furthermore, the research and practice facets of quality and impact are deliberately posed as equally valid and valuable, even though not all stakeholders in practice-oriented educational research will agree with these notions. As a result of these self-imposed limits, this dissertation contributes to increased conceptual understanding of the quality and impact of practice-oriented educational research but does not provide an undisputed or definitive picture.

6.2.3 REFLECTION ON THE STATES OF DISCUSSION ON QUALITY, IMPACT AND THEIR INTERRELATEDNESS

Looking back on the conceptualisations of quality, impact and their interrelatedness in Chapter 2, 3 and 5, it becomes apparent that all three are approached differently. These differing approaches seem to correspond with the differing states of discussion of these concepts within the field of educational research in general and practice-oriented educational research in particular.

Issues of quality are much debated since the establishment of educational research as a field of research (Lagemann, 2000). Debates mainly centred on conceptualisations of quality in terms of quality concerns within different research approaches and for different research methodologies. This resulted in a multitude of lists of quality concerns, for example for quantitative research and qualitative research (Guba, 1981; Howe & Eisenhart, 1990; Swanborn, 1996; Poortman & Schildkamp, 2012), for practice-oriented research in general (Oancea & Furlong, 2007; Verschuren, 2009; Ros & Vermeulen, 2010) and for action research (Elliot, 2007; Heikkinen, Huttunen, & Syrjälä, 2007; Heikkinen, Huttunen, Syrjälä, & Pesonen, 2012), design research (Nieveen, 1999; Bakker, 2018) and teacher research (Anderson & Herr, 1999; Heikkinen, de Jong, & Vanderlinde, 2016) in

particular. Others questioned the value of defined sets of quality concerns (e.g., Hammersley, 2007; Bridges, 2009) or addressed the nature of quality (e.g., Salmon, 2003; Wittek & Kvernbekk, 2011). Overall, some shared understanding within the field of educational research is observed in the literature, namely that quality can be considered as an objective or subjective concept and that it can be elaborated in multiple quality concerns. Building on this, it can be established that perceptions of quality can differ and that context-free and fixed conceptualisations of quality and corresponding quality concerns are improbable. As a result of this state of the field, we explicitly positioned the results of our study on teacher-researchers' perspectives on the quality of practice-oriented educational research as stipulative, i.e., context-bound and tentative, and complementary to existing perspectives in the literature.

Concerning impact of practice-oriented educational research on the other hand, discussions on its conceptualisation are limited. Most studies focus on how research can impact practice (e.g., Weiss, 1979; Dagenais et al., 2012; Tseng, 2012) or analyse achieved impact of specific research studies (e.g., Goodnough, 2011; Meijer et al., 2013; Vrijnsen-de Corte, den Brok, Kamp, & Bergen, 2013; Hilton & Hilton, 2017) using diverse frameworks for analysis. Explications or underpinnings of how impact is conceptualised are typically limited. Two notable exceptions are the conceptualisation of the scale of educational reform by Coburn (2003) and a framework for analysis of the impact of teacher-led development work by Frost and Durrant (2002). The proliferation of ideas and corresponding lack of a shared understanding observed in the literature seemed to complicate discussions on the impact of practice-oriented educational research, not in the least because it complicates comparison of impact across studies. To discuss, analyse and compare impact, some common understanding seemed warranted. Consequently, we aspired to contribute to a shared understanding, resulting in a conceptual framework of impact comprised of the three dimensions scope, nature and progress.

The interrelatedness of quality and impact of practice-oriented educational research does not receive explicit attention in current discussions on practice-oriented educational research. Since perceptions of the interrelatedness of quality and impact can affect practice-oriented educational research, for example how research proposals are assessed and how studies are conducted and evaluated, some understanding seemed worthwhile. We therefore explored

perceptions of the interrelatedness of quality and impact to gain understanding on how perceptions differ.

Overall, we added a new perspective to the much discussed and explored concept of quality, aspired to contribute to a shared understanding of the under-conceptualised concept of impact, and explored the so far not systematically explored interrelatedness of quality and impact, fitting with gaps in the literature as we perceived them.

6.2.4 REFLECTION ON THE NATURE OF QUALITY AND IMPACT

Following on from the previous paragraph, not only the states of discussion but, in our perception, the nature of the concepts of quality and impact differ, affecting how they are conceptualised in this dissertation. On the one hand, quality was perceived as inherently subjective, containing norms or value judgements. Reflecting on the findings of this dissertation, we maintain this perception. First of all, the selection of quality concerns to include in a conceptualisation of quality is subjective. Perceptions on this issue differ, evident from a multitude of lists of quality concerns available in the literature. Subsequently, we define the quality concerns from the teacher-researchers' perspectives (Chapter 2) as 'the extent to which…', indicating that there are no yes or no answers as to whether quality concerns are met. Lastly, quality concerns do not necessarily jointly reinforce quality of a practice-oriented educational research study. Quality concerns can be conflicting, meaning that meeting one (e.g., methodological quality concerns) can hinder meeting another (e.g., ecological concerns or concerns for relevance). What quality concerns to prioritise is a normative decision.

Impact, on the other hand, was perceived as an objective concept and consequently conceptualised in terms of dimensions (i.e., scope, nature, progress), which were considered value-free and objectively observable, similar to the dimensions of a cube (i.e., height, width, depth). However, in retrospect, conceptualisations of impact are not as objective as we assumed in advance. What subdimensions to include within the dimension of impact, and subsequently what to include within these subdimensions, does result from subjective norms or value judgements. For example, whether to include educational practice, research or both within the scope of impact is subject to perceptions of the aim(s) of practice-oriented educational research. The subjectivity of our conceptualisation of impact could also be taken a step further by deliberately extending it with normative considerations concerning the extent of scope, nature

and progress of impact to be aspired or achieved. This could yield benchmarks on when impact is considered sufficient. More research is required to find a worthwhile and workable way to achieve this.

6.3 Reflection on research context and methodology

6.3.1 REFLECTION ON THE NETHERLANDS AS THE CONTEXT OF STUDY

In the Netherlands, in line with classifications by NRO, three main forms of scientific educational research are distinguished: practice-oriented, fundamental and policy-oriented research. Practice-oriented educational research is the main form of research, evident from the distribution of research funding (NRO, 2018) and the self-reported practices of educational researchers (van Braak & Vanderlinde, 2012). In addition, there is considerable attention for the perceived gap between educational research and practice by educational researchers (e.g., Pieters & Jochems, 2003; Broekkamp, Vanderlinde, van Hout-Wolters, & van Braak, 2009; Jochems, 2012; Voogt, McKenney, Pareja Roblin, Ormel, & Pieters, 2012; Bakx, Bakker, & Beijaard, 2014) and there are ample initiatives to decrease or close this gap, such as the establishment of lectorates at universities of applied sciences, professional development schools (academische opleidingsscholen) and educational research workshops (werkplaatsen onderwijsonderzoek). Consequently, many educational researchers in the Netherlands are involved in and concern themselves with practice-oriented educational research, resulting in a rich context to conduct research on practice-oriented educational research. Moreover, because the distinction between practice-oriented and other forms of research is well known within the Dutch educational research community, researchers are able to articulate their perspectives on practice-oriented educational research as one particular form of research. Circumstances in the Netherlands are therefore considered favourable for the study in Chapter 5 on the interrelatedness of quality and impact of practice-oriented educational research.

The particular interpretation of practice-oriented educational research current in the Netherlands and in this dissertation (following the definition by NRO) affected the findings of this dissertation. In other countries different forms of research may be distinguished or distinctions may be less articulate. For example, in the Netherlands, scientific research by teacher-researchers is considered practice-

oriented educational research. In other countries (e.g., Australia, United Kingdom, United States), similar research is distinctively marked as teacher inquiry or teacher research and considered as separate from university-based practice-oriented research practices (McLaughlin, 2004; Cochran-Smith & Lytle, 2009; Mockler & Groundwater-Smith, 2017). Also, different names, definitions and characterisation of practice-oriented educational research are in use (e.g., Oancea & Furlong, 2007; Wyse, Brown, Oliver, & Poblete, 2018) that may be more prominent in other contexts. These differences can potentially render the findings of this dissertation less applicable.

6.3.2 REFLECTION ON THE POSTDOC-VO PROJECT AS THE CONTEXT OF STUDY

Three out of four studies in this dissertation are conducted in the context of the Postdoc-VO pilot project. This context was expected to be suitable due to alignment of the project aim with the twofold aim of practice-oriented educational research, and the dual positions and experiences of the teacher-researchers. This enabled the teacher-researchers to consider quality from both a research and practice perspective, and to align their studies with both educational practice and research to facilitate impact. Based on the findings in Chapter 2, 3 and 4, it can be concluded that the predominant focus of the postdoctoral teacher-researchers was educational practice. This makes sense, considering their primary and permanent positions and extensive experiences as teachers, and their secondary and temporary positions and more limited experiences as researchers. Our study to identify a practice perspective on quality of practice-oriented educational research (Chapter 2) benefited from this predominant focus on educational practice, as we were principally interested in the teacher-researchers' perspectives as teachers. Perhaps less advantageous of the teacher-researchers as respondents is that perspectives on quality from teachers without research experience, which is the majority of teachers, remain unknown. The teacher-researchers' predominant focus on educational practice also affected the studies into the impact of practice-oriented educational research (Chapter 3 and 4). The teacher-researchers elaborately discussed impact in educational practice, enabling detailed insights for conceptualising impact and analysing actualised impact. In contrast, their elaboration of impact in educational research was less articulate, leading to a less detailed and more confined conceptualisation and corresponding analysis of actualised impact.

Overall, we contend that the postdoctoral teacher-researchers were suitable respondents in our studies. Even though their predominant focus was on educational practice, we also benefited from their additional positions and experiences as researchers, as these enabled them to articulate their views on quality of practice-oriented educational research. Considering the intricateness of the issue, this would be very difficult for teachers without considerable research experience. Regarding impact, it might be too demanding to expect an equally prominent focus on both facets of impact. We can imagine this would apply to any researcher, whether or not in a dual position as a teacher.

Furthermore, two other notable features of the Postdoc-VO pilot project studies might have affected the findings of the studies in this dissertation. First, the teacher-researchers' studies were all design-based studies with the explicit characteristics as interventionist, iterative, process-, utility- and theory-oriented (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006). This raises the question whether the findings of the studies also apply to other practice-oriented educational research approaches, such as action research and lesson study. The articulated quality concerns in Chapter 2, for example, explicitly address quality of interventions, and the achieved impact discussed in Chapter 4 partly emanates from stakeholders' involvement in interventions (e.g., as participants or designers). However, not all practice-oriented educational research approaches include interventions, potentially affecting the value of the identified quality concerns and requiring alternative considerations on how to involve stakeholders in studies to actualise impact. Second, all teacher-researchers were science or mathematics teachers. Their disciplinary backgrounds possibly affected their perspectives on the quality of practice-oriented educational research, as interpretations of quality can differ across disciplines.

Limiting the context of three of the four studies to the Postdoc-VO context and the consequent longitudinal involvement of the researcher in this context contributed to in-depth understanding of the teacher-researchers' dual positions and their research projects. This is elaborated on in the next paragraph. Limiting the research context also contributed to the inevitable limitation that it is hard to discern how the findings in this context relate to other contexts.

6.3.4 REFLECTION ON METHODOLOGY

The findings of this dissertation are based on qualitative research. Qualitative research approaches are particularly suited for research on issues that are ill

understood or have not been addressed from a certain perspective (Creswell, 2003) and therefore fit with the overall research aim to increase conceptual understanding of quality and impact of practice-oriented educational research and their interrelatedness, and to identify how these can be actualised.

In the collection as well as the analysis of data, multiple strategies were employed to ensure the quality of the research. In all studies, respondents were purposefully selected (Patton, 2002) in line with the particular aims of the studies. Forms of triangulation (Miles & Huberman, 1994) were applied in three of the four studies. Method triangulation was applied in the studies in Chapter 2 and 3 by collecting data, respectively on teacher-researchers' quality concerns and ideas concerning impact, using multiple methods, i.e., individual interviews, individual reflections, and small group discussions. Actor triangulation was applied in the study in Chapter 4 by collecting data from multiple actors, i.e., teacher-researchers, fellow teachers, school principals, fellow researchers, research supervisors, on the achieved impact of the selected studies. In addition, fitting with the in-depth qualitative nature of the studies, quality audit procedures as developed by Akkerman, Admiraal, Brekelmans and Oost (2006) and extended by de Kleijn and van Leeuwen (2018) were conducted for the four studies. Summative audits of the studies in Chapters 2, 3 and 4 were performed by independent auditors to assess the visibility, comprehensibility and acceptability of the data-analysis procedures and ensuing results. A similar audit was conducted for Chapter 5 by one of the co-researchers.

Furthermore, there was prolonged engagement (Hammerley & Atkinson, 2019) with the teacher-researchers in the Postdoc-VO context over the multiyear course of their research projects. Besides the dedicated moments of data collection, there was additional informal interaction with the teacher-researchers at bimonthly meetings where they attended lectures and discussed their research. Attending these meetings created and sustained reciprocal familiarity between the researcher and the teacher-researchers and served to stay up to date on the progress of the teacher-researchers' projects. This facilitated data collection by contributing to the willingness of the teacher-researchers to participate in the research. It also contributed to the researcher's understanding on developments in the research projects and the positions of the teacher-researchers within their schools and universities. This facilitated data collection and analysis by contributing to a more profound understanding by the researcher on the teacher-

researchers' perspectives, aspirations and achievements concerning quality and impact. A risk of prolonged engagement is becoming overly involved in a context and consequently being unable to study it objectively. However, considering the nature and frequency of the additional informal interaction with the teacher-researchers next to the formal moments of data collection, we consider this risk negligible.

It should be noted that all data collected in the studies focussed on respondents' perceptions, and consequently the results are based on these perceptions. This was fitting for the studies in Chapter 2 and 5 on teacher-researchers' perspectives on quality and researchers' perspectives on interrelatedness of quality and impact respectively. In the studies in Chapter 3 and 4 on the conceptualisation and realisation of impact, additional data beyond the confines of individual perceptions and recollections could have yielded additional insights, more direct evidence on achieved impact, or facilitated causal inferences on how impact resulted from the characteristics of the studies. Data could have been collected through, for example, document analysis of teaching materials and policy documents at schools and research programmes and teacher education curricula at universities, or through observations of classroom practice and teacher meetings at schools and classroom practice and research meetings at universities. However, considering the explorative nature of the studies, we consider data based on respondents' perceptions, reinforced through method and actor triangulation, sufficient.

6.4 Future research

Recommendations for future research have been discussed in Chapters 2 to 5. In this section, we highlight some of these recommendations that align with the overall aim of the dissertation and complement them with additional recommendations based on the main findings, conclusions and reflections presented in this final chapter.

In line with the first part of the overall aim, quality and impact of practice-oriented educational research are conceptualised. Quality is conceptualised as a subjective concept dependent on stakeholders' perspectives. Consequently, conceptualisations of the quality of practice-oriented educational research will continuously shift due to continuously shifting perceptions of stakeholders concerning practice-oriented educational research in general and its quality in

particular. Continued attention and ongoing discussion and research on this issue is therefore warranted to keep conceptualisations of quality current with shifting perceptions. Impact, on the other hand, was considered an objective concept upfront, but was found to be subjective to some extent as well. As elaborated in paragraph 6.2.4, conceptualisations of impact could benefit from the explicit inclusion of normative considerations. Research is required to expand conceptualisations of impact in this regard in meaningful ways.

Fitting with the second part of the overall aim, it was identified how practice-oriented educational research can be designed to facilitate impact in educational practice. However, research design is only one of many factors known to affect the actualisation of impact. Future research could analyse how the influence of research design relates to other factors external to a research study, such as characteristics of the school organisation and culture, the role of the principal, teacher beliefs, motivations, expectations and interpretations, issues of dissemination and timing, and the perceived gap between educational research and practice (Burkhardt & Schoenfeld, 2003; Gore & Gitlin, 2004; Berger, Boles, & Troen, 2005; Brown, 2005; Broekkamp & van Hout-Wolters, 2007; Cordingley, 2008; Oates, 2008; Dagenais et al., 2012; Anwaruddin 2015; Lee & Seashore Louis, 2019; Liou, Canrinus, & Daly, 2019). Furthermore, it remains unknown how research design or other factors affect impact of practice-oriented educational research studies on educational research. Since practice-oriented educational research has the characteristic twofold aim to contribute to educational practice and research, it could be worthwhile to explore how impact in educational research can be further actualised. Research into if and how impact in educational practice and research potentially align, reinforce or hinder each other could also yield valuable insights. Concerning the actualisation of quality of practice-oriented educational research, mere conceptualisations do not illuminate how quality concerns can be addressed in practice-oriented educational research studies to allay these concerns. Pathways towards actualising practice-oriented educational research studies with quality requires further research.

The interrelatedness of quality and impact was deemed relevant for practice-oriented educational research as it could affect the design, effectuation, assessment, and financing of studies. Future research could elaborate how different conceptualisations of the interrelatedness between quality and impact affect practice-oriented educational research studies at these different stages.

This could yield insight in the tenability of the different conceptualisations and if some conceptualisation(s) could be more productive to concurrently actualise the quality and impact of practice-oriented educational research studies.

Furthermore, teacher-researchers have valuable insights and ideas concerning practice-oriented educational research, evident from the studies presented in this dissertation. The inclusion of their perspectives in studies on and discussions of practice-oriented educational research can enrich the currently more dominant perspectives of researchers and level the playing field between the two main stakeholders in practice-oriented educational research. It is therefore advisable to involve and consult teacher-researchers in future studies and discussions. It could be worthwhile to explore if and how non-researching teachers can be involved as well.

6.5 Implications for practice-oriented educational research practice and policy

Quality and impact are at the heart of practice-oriented educational research. We urge practice-oriented educational researchers to deliberately contemplate and address quality and impact, both in educational research and practice, at all stages of their studies from design to evaluation. Although quality and impact are hitherto mostly considered in isolation, we recommend considering them concurrently and in relation to each other. This can prevent mutually excluding conceptualisations of quality and impact and consequently lead to more productive considerations towards the actualisation of practice-oriented research studies with both quality and impact. The results presented in this dissertation provide starting points for considerations of quality, impact and their interrelatedness, and reveal what underlying assumptions, choices, norms and values require explication to facilitate clarity and depth.

In addition to individual considerations, quality and impact of practice-oriented educational research and their interrelatedness should also be jointly discussed among practice-oriented educational researchers. All practice-oriented educational researchers should be involved in such discussions, from PhD candidates and postdoctoral researchers to assistant, associate and full professors at universities and universities of applied sciences, also explicitly including teacher-researchers. These discussions can be among PhD candidates and their supervisors, researchers within an institution, or researchers across

institutions at national and international conferences. Joint discussions on quality and impact of practice-oriented educational research and their interrelatedness can facilitate the development of knowledge on these issues, promote shared understanding and contribute to realising the potential of practice-oriented educational research, both as a research approach and of individual studies. Since perspectives on practice-oriented educational research, quality, impact and their interrelatedness can shift over time, continuous attention to conceptualisation of these issues is warranted.

In calls for proposals for practice-oriented educational research by subsidy providers, conceptualisations of quality, impact and their interrelatedness should be explicated. First, it should be made clear what quality concerns are to be addressed. Including both researcher and practitioner perspectives in the establishment of these quality concerns should result in the inclusion of concerns on truth value and neutrality, on applicability, consistency and cumulativity in research and practice, and recognisability and effectivity in practice. Second, desired impact, both in educational research and practice, should be established in terms of scope, nature and progress. Third, the interrelatedness of quality and impact should also be explicated to elucidate when issues of quality and impact are to be addressed in the called for practice-oriented educational studies, i.e., in the design, execution, report or evaluation. In the assessment of submitted proposals, aspired impact should not be mutually compared across proposals, but should be assessed on fit with the aim and method of a study.

Furthermore, practice-oriented educational researchers can anticipate impact, specifically in educational practice, in the design of their studies. Selection of a research topic with some urgence in educational practice, preferably in consultation with practitioners, involvement of practitioners in a study in substantial ways, and reification of parts of the research are recommended. Conscious consideration of the aspired scope, nature and progress of impact can help to identify how to address these recommendations, i.e., what practitioners to involve, how to involve them, or what parts of the research to materialise.

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SAMENVATTING IN HET NEDERLANDS

Praktijkgericht onderwijsonderzoek is wetenschappelijk onderzoek dat start vanuit een probleem in de onderwijspraktijk, wordt uitgevoerd in de onderwijspraktijk met betrokkenheid van relevante belanghebbenden (bijvoorbeeld, docenten en onderzoekers) en voortbouwt op en beoogt bij te dragen aan wetenschap en praktijk. Praktijkgericht onderwijsonderzoek kent in de afgelopen decennia een toenemende populariteit. Er is echter ook kritiek, met name wat betreft kwaliteit en impact. Kritiek op de kwaliteit bestaat er voornamelijk uit dat praktijkgericht onderwijsonderzoek onvoldoende past binnen bestaande opvattingen over kwaliteit. Het tweeledige doel van praktijkgericht onderwijsonderzoek om bij te dragen aan wetenschap én praktijk alsmede het gebruik van daarbij passende onderzoeksmethodieken, zoals actieonderzoek, ontwerponderzoek en *lesson study*, lijken hieraan ten grondslag te liggen. Ook de impact van praktijkgericht onderwijsonderzoek wordt in twijfel getrokken. Percepties van de behaalde impact halen het niet bij de hoge verwachtingen die geschept worden door de karakteristieken en het tweeledige doel van praktijkgericht onderwijsonderzoek.

Kwaliteit en impact zijn twee centrale begrippen in praktijkgericht onderwijsonderzoek, die in de literatuur tot dusver voornamelijk eenzijdig benaderd worden. Kwaliteit wordt bekeken vanuit het perspectief van de onderwijswetenschappen en impact wordt beperkt tot de onderwijspraktijk. In lijn met het tweeledige doel van praktijkgericht onderwijsonderzoek om bij te dragen aan zowel wetenschap als praktijk, worden kwaliteit en impact in dit proefschrift tweezijdig benaderd. Kwaliteit wordt daarom bekeken vanuit het perspectief van de onderwijspraktijk, in aanvulling op tot dusver dominante perspectieven vanuit de wetenschap, en impact in praktijk én wetenschap worden gelijkwaardig benaderd. Ook de samenhang tussen kwaliteit en impact wordt in dit proefschrift verkend omdat dat kan bijdragen aan verdere verdieping.

Door kwaliteit en impact als tweezijdig en in relatie tot elkaar te onderzoeken beoogt dit proefschrift bij te dragen aan het realiseren van het latente potentieel van praktijkgericht onderwijsonderzoek wat betreft kwaliteit en impact. Het streven is dat de resultaten praktijkgerichte onderwijsonderzoekers ondersteunen kwaliteit vanuit zowel praktisch als wetenschappelijk perspectief te overwegen en impact doelmatig te mee te nemen in het opzetten en plannen van

hun onderzoek. Daarnaast beogen wij met de resultaten van dit proefschrift de discussie over kwaliteit en impact binnen de gemeenschap van praktijkgerichte onderwijsonderzoekers te verrijken en subsidieverstrekkers te ondersteunen bij het opzetten van calls die leiden tot onderzoeksvoorstellen die in voldoende mate tegemoet komen aan wensen wat betreft kwaliteit en impact.

Het **doel** van dit proefschrift is om, door kwaliteit en impact van praktijkgericht onderwijsonderzoek als tweezijdig te benaderen, (i) bij te dragen aan conceptualisering van kwaliteit, impact en hun samenhang, en (ii) te verkennen hoe kwaliteit, impact en hun samenhang dienovereenkomstig geactualiseerd kunnen worden. De overkoepelende onderzoeksvraag in dit proefschrift luidt:

> *Hoe kunnen de kwaliteit en impact van praktijkgericht onderwijsonderzoek en hun samenhang geconceptualiseerd en geactualiseerd worden?*

Deze onderzoeksvraag is beantwoord door middel van vier studies, elk met een eigen onderzoeksvraag en bijpassende kwalitatieve methoden.

De **context** van drie van de vier studies is de pilot van het Postdoc-VO project waarin tien gepromoveerde bètadocenten in het voorgezet onderwijs een beurs ontvingen om een praktijkgericht onderwijsonderzoek uit te voeren binnen hun eigen school. De vierde studie is uitgevoerd in de Nederlandse gemeenschap van onderwijsonderzoekers.

In **Hoofdstuk 2** zijn de perspectieven van docentonderzoekers op kwaliteit van praktijkgericht onderwijsonderzoek in kaart gebracht, en is geanalyseerd hoe deze verschillen van onderzoeksperspectieven in de literatuur. De onderzoeksvraag in deze studie luidt:

> *Wat zijn de perspectieven van docentonderzoekers op de kwaliteit van praktijkgericht onderwijsonderzoek en hoe verschillen die van de onderzoeksperspectieven in de literatuur?*

In een kwalitatief empirisch onderzoek zijn de perspectieven van de tien postdoctorale docentonderzoekers uit het Postdoc-VO project in kaart gebracht door middel van individuele reflecties, discussies in kleine groepen en semigestructureerde interviews. Analyse van de data volgde een *informed*

grounded theory strategie waarbij kwaliteitsnormen uit de literatuur als *sensitising* concept het uitgangspunt vormden.

De resultaten van dit onderzoek laten zien dat de betreffende docentonderzoekers zeven kwaliteitsnormen van belang achten: waarheidsgehalte en neutraliteit, toepasbaarheid, consistentie en cumulativiteit in wetenschap en onderwijspraktijk, en herkenbaarheid en effectiviteit in de onderwijspraktijk. De resultaten duiden op drie noemenswaardige verschillen tussen conceptualiseringen van kwaliteit van praktijkgericht onderwijsonderzoek vanuit het perspectief van de docentonderzoekers en de wetenschap zoals beschreven in de literatuur. Ten eerste komen de kwaliteitsnormen van de docentonderzoekers niet volledig overeen met de kwaliteitsnormen vanuit onderzoeksperspectieven zoals beschreven in de literatuur. Verschillen lijken voort te komen uit verschillen in aannames die ten grondslag liggen aan de perspectieven. De aanname van de docentonderzoekers lijkt te zijn dat kwaliteit bepaald wordt door gebruikers van praktijkgericht onderwijsonderzoek (dat wil zeggen docenten), terwijl de aanname bij de onderzoeksperspectieven lijkt te zijn dat kwaliteit een inherente eigenschap van een onderzoek is.

Ten tweede maken de docentonderzoekers geen expliciet onderscheid tussen kwaliteitsnormen gericht op de wetenschap of de praktijk. In de literatuur wordt, overeenkomstig met het tweeledige doel van praktijkgericht onderwijsonderzoek om bij te dragen aan wetenschap en praktijk, veelal onderscheid gemaakt tussen wetenschapsgerichte en praktijkgerichte kwaliteitsnormen. De kwaliteitsnormen van de docentonderzoekers voor wetenschap en praktijk liggen daarentegen meer op één lijn, zoals toepasbaarheid, consistentie en cumulativiteit in wetenschap én praktijk.

Ten derde benoemen de docentonderzoekers kwaliteitsnormen voor verschillende aspecten van praktijkgericht onderwijsonderzoek, zoals interventie, methode en resultaten, terwijl de kwaliteitsnormen in de literatuur gewoonlijk betrekking hebben op praktijkgericht onderwijsonderzoek als geheel. Het verschil in focus op aspecten of het geheel toont verschillen in perspectieven op de aard van praktijkgericht onderwijsonderzoek. De docentonderzoekers lijken praktijkgericht onderwijsonderzoek als een proces of product te beschouwen, terwijl het in de literatuur gezien wordt als een onderzoeksbenadering.

De resultaten van Hoofdstuk 2 duiden op het belang van explicitering van hoe kwaliteit geconceptualiseerd en dienovereenkomstig geoperationaliseerd wordt in kwaliteitsnormen. Dit geldt voor betrokkenen bij praktijkgericht onderwijsonderzoek in diverse rollen, bijvoorbeeld als uitvoerder van een onderzoek, beoordelaar van onderzoeksvoorstellen of manuscripten of financier van praktijkgericht onderwijsonderzoek. Aandacht voor aannames die ten grondslag liggen aan de conceptualisering van kwaliteit lijkt daarbij belangrijk.

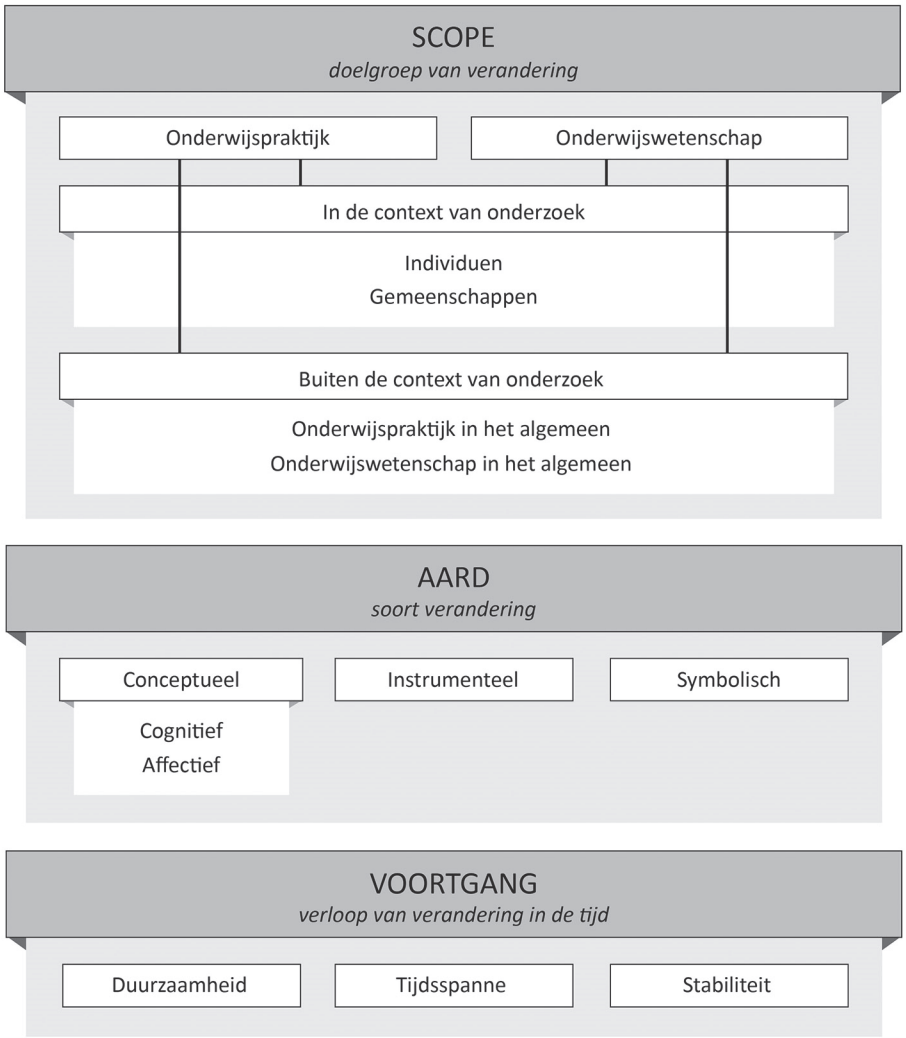
In **Hoofdstuk 3** is een conceptualisering van de impact van praktijkgericht onderwijsonderzoek uitgewerkt met als doel bij te dragen aan gedeeld begrip van wat impact is, kan of zou moeten zijn. Impact is geoperationaliseerd in drie dimensies: *scope* verwijst naar de doelgroep voor verandering, *aard* naar het soort verandering en *voortgang* naar het verloop van verandering in de tijd. Deze dimensies zijn theoretisch ingevuld en vervolgens empirisch onderbouwd op basis van een kwalitatief onderzoek naar de impact van de praktijkgerichte studies van dezelfde tien docentonderzoekers uit het Postdoc-VO project. De onderzoeksvraag hierbij is:

> *Wat beschrijven de docentonderzoekers als de beoogde en behaalde impact van hun praktijkgericht onderwijsonderzoek in de onderwijswetenschappen en -praktijk?*

Data zijn verzameld door middel van individuele reflecties, discussies in kleine groepen, en semigestructureerde interviews met de docentonderzoekers. De data zijn deductief geanalyseerd volgens een coderingsschema gebaseerd op de theoretische invulling van de dimensies van impact. Daarbij bleef een open blik behouden voor nieuwe subdimensies die uit de data naar voren kwamen.

Het onderzoek resulteert in een tweezijdige conceptualisering van impact waarin de dimensies van impact op gelijke wijze ingevuld kunnen worden voor wetenschap en praktijk. Figuur S.1 bevat een visuele weergave van deze conceptualisering van impact. Of en hoe de dimensies ingevuld worden kan verschillen en reflecteert onderliggende ideeën over de impact die meegenomen zou moeten worden. Bijvoorbeeld: Wordt de scope van impact ingevuld en horen daar veranderingen in onderwijspraktijk, wetenschap of beide bij? Wordt de aard van impact meegenomen en hoort daar cognitieve, instrumentele, symbolische of meerdere soorten verandering bij? Is de voortgang van impact van belang en

horen daar initiële of duurzame veranderingen bij of veranderingen die verschuiven in de tijd?



Figuur S.1: Conceptualisering van impact

Door te focussen op de dimensies van impact, zonder normatief te worden en zonder voor te schrijven welke impact te behalen of te prioriteren of hoe impact te realiseren, biedt de gepresenteerde conceptualisering de mogelijkheid om impact op gestructureerde wijze te overdenken. De conceptualisering van impact

biedt praktijkgerichte onderwijsonderzoekers en andere belanghebbenden handvatten

om beoogde en/of behaalde impact op een heldere manier in kaart te brengen.

In **Hoofdstuk 4** is geïdentificeerd of en hoe de karakteristieken van praktijkgericht onderwijsonderzoek bijdragen aan het realiseren van impact in de onderwijspraktijk en wetenschap. In een kwalitatieve meervoudige gevalsstudie is de behaalde impact van drie doelmatig geselecteerde praktijkgerichte studies uit het Postdoc-VO project, uitgevoerd door de docentonderzoekers, geanalyseerd en gerelateerd aan de vier karakteristieken van praktijkgericht onderwijsonderzoek. Deze karakteristieken zijn dat een praktijkgericht onderzoek (1) start vanuit een probleem in de onderwijspraktijk, (2) wordt uitgevoerd in de onderwijspraktijk (3) met betrokkenheid van relevante belanghebbenden (bijv. docenten en onderzoekers), en (4) voortbouwt op en beoogt bij te dragen aan wetenschap en praktijk. De onderzoeksvragen hierbij zijn:

> *Wat is de behaalde impact, in termen van scope, aard en voortgang, van de praktijkgerichte onderwijsonderzoeken van docentonderzoekers, volgens de docentonderzoekers en belanghebbenden uit de lokale context?*
>
> *Hoe kunnen de scope, aard en voortgang van de behaalde impact van de praktijkgerichte onderwijsonderzoeken van de docentonderzoekers gerelateerd worden aan de karakteristieken van praktijkgericht onderwijsonderzoek?*

Data zijn verzameld door middel van semigestructureerde interviews met de docentonderzoekers en belanghebbenden in de scholen (schoolleiders en collega-docenten) en universiteiten (begeleiders en collega-onderzoekers) waar de onderzoeken zijn uitgevoerd. In individuele casus analyses is de behaalde impact van de onderzoeken in kaart gebracht op basis van de conceptualisering van impact uit Hoofdstuk 3. Vervolgens is in een cross-case analyse de scope, aard en voortgang van de behaalde impact gerelateerd aan de karakteristieken van de onderzoeken.

De resultaten laten zien dat in het ontwerp van een praktijkgericht onderwijsonderzoek impact in de onderwijspraktijk voorzien kan worden. Wat betreft de scope van impact lijkt het onderwerp van onderzoek en hoe dat wordt

vastgesteld het belangrijkst. De behaalde impact sluit namelijk aan bij het onderwerp of de actoren waar het onderzoek zich op richt, en belanghebbenden die betrokken waren bij het vaststellen van het onderwerp van onderzoek rapporteren vaker impact. De aard van behaalde impact ligt in lijn met de aard van de betrokkenheid van belanghebbenden in een onderzoek. Wezenlijke betrokkenheid van belanghebbenden leidt tot wezenlijke veranderingen waardoor impact verder gaat dan alleen conceptuele verandering en (ook) leidt tot instrumentele veranderingen. De voortgang van impact kon niet direct gerelateerd worden aan de karakteristieken van praktijkgericht onderwijsonderzoek, maar het materialiseren van (delen van) het onderzoek, zoals onderliggende ideeën, interventies of resultaten, lijkt verbonden met duurzame veranderingen. De resultaten laten niet zien of het mogelijk is om impact in de wetenschap te anticiperen.

Op basis van bovenstaande bevindingen is het raadzaam om bij het ontwerpen van een praktijkgericht onderwijsonderzoek een onderwerp te selecteren dat tegemoet komt aan een lokale behoefte, bij voorkeur in overleg met lokale belanghebbenden. Daarnaast is het zinvol om in het ontwerp aandacht te hebben voor de aard van de betrokkenheid van lokale belanghebbenden in de verschillende fases en aspecten van een onderzoek, zoals vraagarticulatie, interventie, datacollectie of -analyse. Verder wordt geadviseerd om in het ontwerp van een praktijkgericht onderwijsonderzoek na te denken over het materialiseren van (delen van) het onderzoek. Als laatste lijkt het waardevol om al in het ontwerp van een studie aandacht te hebben voor (mogelijke) verschuivingen van impact in de loop van de tijd.

In **Hoofdstuk 5** wordt de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek verkend. De onderzoeksvraag luidt:

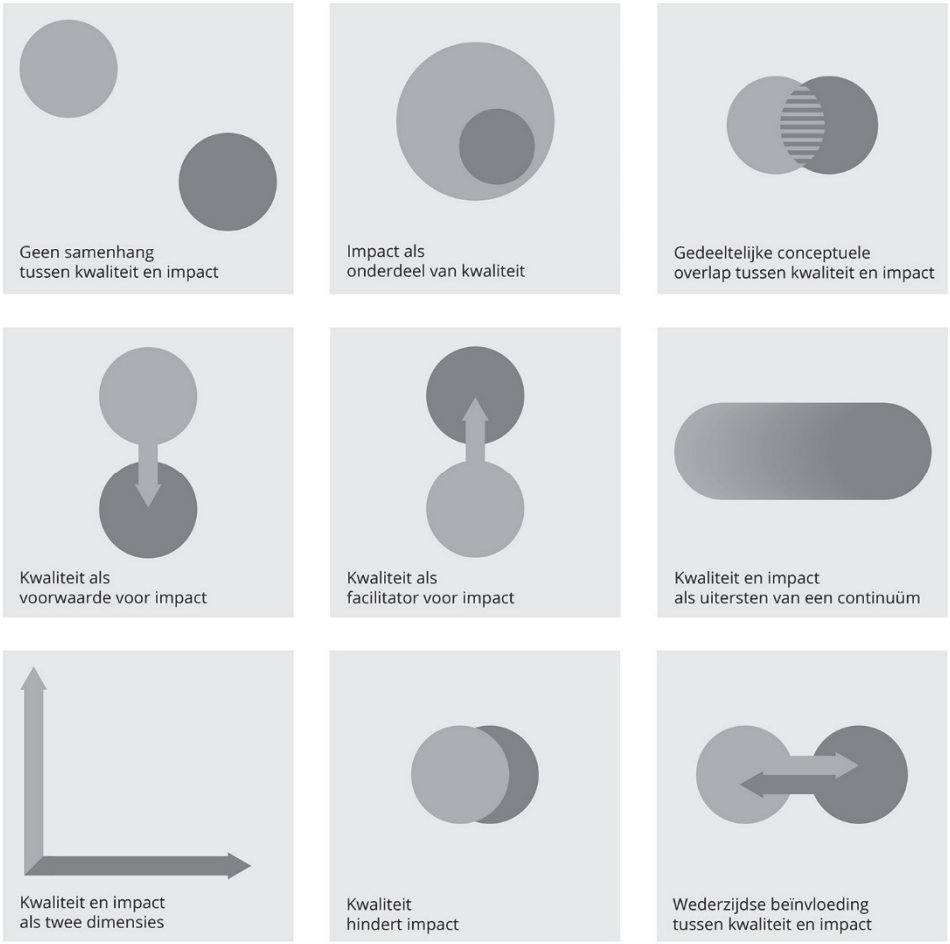
> *Hoe verschillen perspectieven op de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek?*

Geïnformeerd door mogelijke vormen van samenhang uit de literatuur zijn zes doelmatig geselecteerde experts op het gebied van praktijkgericht onderwijsonderzoek uit de Nederlandse gemeenschap van onderwijsonderzoekers geïnterviewd over hun perspectieven op de samenhang tussen kwaliteit en impact. Analyse van de data volgde een *informed grounded*

theory strategie waarbij de mogelijke vormen van samenhang uit de literatuur als *sensitising* concepts het uitgangspunt vormden.

De samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek kan op verschillende manieren geconceptualiseerd worden, zoals blijkt uit de diverse vormen van samenhang uit de literatuur en de diverse perspectieven die naar voren komen in het empirisch onderzoek. In hoofdstuk 5 komen negen vormen van samenhang tussen kwaliteit en impact aan bod: (1) geen samenhang, (2) impact als onderdeel van kwaliteit, (3) gedeeltelijke conceptuele overlap tussen kwaliteit en impact, (4) kwaliteit als voorwaarde voor impact, (5) kwaliteit als facilitator voor impact, (6) kwaliteit en impact als uitersten van een continuüm, (7) kwaliteit en impact als twee dimensies, (8) kwaliteit hindert impact, en (9) wederzijdse beïnvloeding tussen kwaliteit en impact. Figuur S.2 toont visuele weergaves van deze vormen van samenhang.

Verschillen in perspectieven op de samenhang tussen kwaliteit en impact weerspiegelen drie onderliggende punten. Ten eerste zijn perspectieven op de samenhang vervlochten met onderliggende conceptualiseringen van kwaliteit en impact. Kwaliteit wordt gewoonlijk geassocieerd met methodologische kwaliteitsnormen, ecologische kwaliteitsnormen, en relevantie. Een logisch gevolg van deze invulling van kwaliteit, en de nauwe verbondenheid van ecologische kwaliteit en relevantie met impact, is dat kwaliteit en impact op enige wijze met elkaar verbonden zouden moeten zijn en dat gebrek aan samenhang of onderlinge uitsluiting niet aan de orde zijn. Impact wordt veelal beperkt tot bijdragen aan de onderwijspraktijk, ook al komt dat niet overeen met het tweeledige doel van praktijkgericht onderwijsonderzoek om bij te dragen aan onderwijspraktijk én wetenschap. Ten tweede geven perspectieven op de samenhang ideeën over de volgordelijkheid van kwaliteit en impact weer. In praktijkgerichte onderwijsonderzoek kunnen kwaliteit en impact simultaan of sequentieel aan de orde zijn. Ideeën hierover beïnvloeden welke vormen van samenhang als geschikt gezien worden. Ten derde verschillen vormen van samenhang in termen van gepercipieerde werkelijkheid, aannemelijkheid en wenselijkheid. Sommige vormen van samenhang worden ervaren als de huidige realiteit terwijl andere vormen van samenhang als aannemelijk of (on)wenselijk bestempeld worden. Dit duidt op verschillen in hoe de samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek is en hoe die zou kunnen of moeten zijn.



Figuur S.2: Vormen van samenhang tussen kwaliteit en impact van praktijkgericht onderwijsonderzoek.

Bij het actualiseren van praktijkgericht onderwijsonderzoek met kwaliteit en impact lijkt het noodzakelijk om onderliggende perspectieven op hun samenhang te expliciteren omdat dit consequenties kan hebben voor het ontwerp, de uitvoering, beoordeling en financiering van praktijkgericht onderwijsonderzoek. Hoe de samenhang tussen kwaliteit en impact gepercipieerd wordt, beïnvloedt of en wanneer beide aandacht krijgen in een praktijkgericht onderwijsonderzoek.

De **voornaamste bevindingen** van dit proefschrift zijn de onderliggende punten die weerspiegeld worden in conceptualiseringen van kwaliteit en impact van praktijkgericht onderwijsonderzoek en hun samenhang. In huidige discussies

over kwaliteit, impact en hun samenhang blijven conceptualiseringen en onderliggende aannames, keuzes, normen en waarden veelal impliciet. Dit resulteert in vage conceptualiseringen, bemoeilijkt heldere en scherpe discussies over deze onderwerpen en remt de actualisatie van praktijkgericht onderwijsonderzoek met kwaliteit en impact. Dit proefschrift benadrukt het belang van heldere en gerichte discussies waarin expliciete conceptualiseringen van kwaliteit, impact en hun samenhang onderbouwd worden met uitleg over onderliggende aannames, keuzes, normen en waarden, om het potentieel van praktijkgericht onderwijsonderzoek ten volle te realiseren.

Verder laat dit proefschrift zien hoe op impact in de onderwijspraktijk geanticipeerd kan worden bij het opzetten en plannen van een praktijkgericht onderwijsonderzoek. Andere factoren buiten een onderzoek en de invloed van een onderzoeker kunnen impact bemoeilijken of blokkeren. Dit ontslaat een onderzoeker echter niet van de verantwoordelijkheid impact na te streven. Zonder aandacht voor impact in het ontwerp van een onderzoek wordt het behalen van impact buiten de grenzen van een onderzoek en de verantwoordelijkheid van een onderzoeker geplaatst. Door in het ontwerp van een praktijkgericht onderwijsonderzoek aandacht te besteden aan impact kan de kans op impact vergroot worden, ook al is er geen garantie voor succes.

Reflecterend op aannames die aan dit onderzoek ten grondslag liggen, kan ten eerste geconcludeerd worden dat het waardevol is om kwaliteit en impact als tweezijdig te conceptualiseren. Inperking van kwaliteit tot onderzoeksperspectieven en van impact tot de onderwijspraktijk heeft tot dusver zicht op, en derhalve begrip van kwaliteit en impact van praktijkgericht onderwijsonderzoek, beperkt. Door ook praktijkperspectieven op kwaliteit mee te nemen komen andere kwaliteitsnormen in het vizier. Door bijdragen aan de wetenschap, anders dan bijdragen aan de kennisbasis, mee te nemen in conceptualiseringen van impact kan voorheen onderbelichte impact zichtbaar worden. Door onze keuze om kwaliteit en impact als tweezijdig te conceptualiseren - in lijn met het tweeledige doel van praktijkgericht onderwijsonderzoek - blijven perspectieven van andere belanghebbenden (bijvoorbeeld beleidsmakers en subsidieverstrekkers) op kwaliteit, en impact buiten de onderwijspraktijk en wetenschap (bijvoorbeeld beleid en maatschappelijk debat) echter wel buiten beschouwing.

Daarnaast wordt gereflecteerd op de verschillende manieren waarop kwaliteit, impact en hun samenhang benaderd worden in dit proefschrift. Deze verschillen in benadering lijken samen te hangen met verschillen in status van deze concepten in de literatuur. We voegen een nieuw perspectief toe aan het veelvuldig bediscussieerde en verkende concept kwaliteit, beogen bij te dragen aan gedeeld begrip van het tot nu toe gering geconceptualiseerde concept impact, en verkennen de tot dusver niet systematisch verkende samenhang tussen kwaliteit en impact, passend bij de, in onze perceptie, hiaten in de huidige literatuur.

Als laatste verschillen niet alleen de status van kwaliteit en impact van praktijkgericht onderwijsonderzoek in de literatuur, maar, in onze ogen, ook hun aard. Dit beïnvloedt hoe kwaliteit en impact in dit proefschrift geconceptualiseerd worden. Kwaliteit wordt aangenomen als zijnde inherent subjectief, bestaande uit normen en waardeoordelen. Reflecterend op de resultaten in dit proefschrift blijft deze aanname overeind. De selectie van kwaliteitsnormen is namelijk subjectief, blijkend uit de veelheid aan lijsten met kwaliteitsnormen in de literatuur en het aanvullende perspectief van de docentonderzoekers zoals dat in hoofdstuk 2 naar voren kwam. Daarnaast worden in hoofdstuk 2 de kwaliteitsnormen vanuit het perspectief van de docentonderzoekers gedefinieerd als ‘de mate waarin…’. Dit wijst er op dat er geen eenvoudig ja of nee antwoord opgaat voor de toepassing van kwaliteitsnormen. Verder versterken kwaliteitsnormen niet noodzakelijkerwijs gezamenlijk de kwaliteit van een praktijkgericht onderwijsonderzoek. Kwaliteitsnormen kunnen conflicteren waardoor pogingen te voldoen aan een kwaliteitsnorm pogingen te voldoen aan een andere kwaliteitsnorm kunnen hinderen. Welke kwaliteitsnormen prioriteit te geven is een normatieve keuze.

Impact daarentegen wordt aangenomen als zijnde een objectief concept en dienovereenkomstig geconceptualiseerd in termen van dimensies (scope, aard, voortgang) die in eerste instantie waardevrij en objectief leken. Reflecterend op de bevindingen in dit proefschrift constateren wij echter dat onze conceptualisering van impact minder waardevrij en objectief is dan verondersteld. Welke subdimensies mee te nemen in de dimensies scope, aard en voortgang, en vervolgens welke veranderingen mee te nemen in deze subdimensies, volgt uit subjectieve normen en waardeoordelen. De subjectiviteit van de gepresenteerde conceptualisering van impact zou nog verder uitgewerkt kunnen

worden door weloverwogen toevoeging van een normatieve dimensie. Dit zou kunnen resulteren in een ‘meetlat’ voor impact. Meer onderzoek is nodig om een zinvolle en werkbare manier te vinden om dit te realiseren.

Uit de bevindingen van dit onderzoek volgen **suggesties** voor praktijkgericht onderwijsonderzoek. Praktijkgerichte onderzoekers zouden bewuster aandacht kunnen besteden aan kwaliteit en impact, zowel in praktijk als wetenschap, in alle fases van hun onderzoeken, van ontwerp tot evaluatie. Het is raadzaam kwaliteit en impact gelijktijdig en in relatie tot elkaar te overdenken. Dit voorkomt conceptualiseringen van kwaliteit en impact die elkaar uitsluiten. Hierdoor wordt het beter mogelijk om praktijkgericht onderwijsonderzoek met zowel kwaliteit als impact te realiseren. De resultaten van dit proefschrift bieden handvatten bij het overdenken van kwaliteit, impact en hun samenhang, en laten zien welke onderliggende aannames, keuzes, normen en waarden expliciete aandacht behoeven.

Naast individuele overdenkingen zouden kwaliteit, impact en hun samenhang ook meer onderwerp van discussie mogen zijn binnen de gemeenschap van praktijkgerichte onderwijsonderzoekers, variërend van promovendi tot lectoren en professoren aan hogescholen en universiteiten. Discussies kunnen plaatsvinden tussen promovendi en begeleiders, binnen instituten, of tussen onderzoekers van verschillende instituten op nationale of internationale conferenties. Deze gezamenlijke discussies over kwaliteit en impact van praktijkgericht onderwijsonderzoek en hun samenhang kunnen bijdragen aan kennisontwikkeling, gedeeld begrip, en het realiseren van het potentieel van praktijkgericht onderwijsonderzoek, zowel als onderzoeksbenadering als van individuele onderzoeken. Aangezien perspectieven op praktijkgericht onderwijsonderzoek, kwaliteit, impact en hun samenhang in de loop van de tijd kunnen veranderen, is blijvende aandacht voor hun conceptualisering gepast.

Verder zouden subsidieverstrekkers in hun calls voor praktijkgericht onderwijsonderzoek conceptualiseringen van kwaliteit, impact en hun samenhang expliciet(er) kunnen maken. Ten eerste kan duidelijker gemaakt worden welke kwaliteitsnormen van belang zijn. Als de perspectieven van zowel onderzoekers als practici meegenomen worden dan zouden deze normen kunnen zijn: waarheidsgehalte en neutraliteit, toepasbaarheid, consistentie en cumulativiteit in wetenschap en praktijk, en herkenbaarheid en effectiviteit in de praktijk. Ten tweede zou de gewenste impact, zowel in wetenschap als praktijk,

kunnen worden opgebouwd in termen van scope, aard en voortgang. Ten derde zou de samenhang tussen kwaliteit en impact geëxpliciteerd kunnen worden zodat inzichtelijk wordt wanneer er aandacht moet zijn voor kwaliteit en impact in een praktijkgericht onderwijsonderzoek, bijvoorbeeld in ontwerp, uitvoering, rapportage of evaluatie. Verder kan bij de beoordeling van ingediende voorstellen de beoogde impact niet zonder meer onderling vergeleken worden. Afweging van de beoogde impact op basis van het doel en de methode van een onderzoek lijkt meer op zijn plaats.

Als laatste kunnen praktijkgerichte onderwijsonderzoekers in het ontwerp van hun onderzoek anticiperen op impact, met name in de onderwijspraktijk. Het is hiervoor aan te raden een onderwerp van onderzoek met enige urgentie in de onderwijspraktijk te selecteren, bij voorkeur in overleg met practici. Daarnaast is het raadzaam practici op wezenlijke manieren in het onderzoek te betrekken, en (delen van) het onderzoek in bruikbare materialen vast te leggen. Aandacht voor de beoogde scope, aard en voortgang van impact kan verhelderen hoe deze aanbevelingen kunnen worden aangepakt, dus welke practici te betrekken, hoe hen te betrekken, en welke delen van het onderzoek te materialiseren.

DANKWOORD

April 2012, mijn allereerste baan: aan de slag als junior onderzoeker bij het Freudenthal Instituut. Werken in Utrecht en wonen in Eindhoven was geen ideale combinatie, maar ik had het op beide plekken zo goed naar mijn zin dat het alle reistijd waard was. Zo'n acht jaar lang reisde ik 's ochtends vroeg over de A2 en A27 van Eindhoven naar Utrecht en aan het einde van de dag weer terug. Op goede dagen kon dat in 52 minuten; op ongelukkige dagen duurde het wel eens 3 à 4 uur, afhankelijk van de hoeveelheid sneeuw, gebotste auto's, omgewaaide vrachtwagens of tractoren op de weg. Nu, in april 2021, is mijn promotieonderzoek afgerond en heb ik een nieuwe baan gevonden bij de Technische Universiteit Eindhoven. Lekker op fietsafstand, beter voor mijzelf en voor de planeet.

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CURRICULUM VITAE

Suzanne Groothuijsen-Vrancken was born 27 November 1985 in Heerlen, the Netherlands. After obtaining her general secondary education (havo) degree at Sophianum in Gulpen in 2004, she studied Applied Sciences at Fontys University of Applied Sciences in Eindhoven. In 2006, she spent a gap year as a board member of Eindhoven student association Demos. From 2007 to 2009 she was a student member of the Fontys Central Participation Council. After obtaining her Bachelor's degree in August 2009, she continued her education with the master programme Science Education and Communication at Utrecht University. After finishing her thesis on substantive interactions between Applied Sciences programmes and industry, Suzanne obtained her Master's degree in February 2012.

In April 2012, Suzanne started as a junior researcher at the Freudenthal Institute at Utrecht University. She studied how chemistry teachers relate their learning outcomes to components of a professional development trajectory, and what characteristics of a learning environment 11th and 12th grade students in a science talent development programme perceive as stimulating for their learning processes and achievements.

In September 2014, Suzanne began her PhD research on quality and impact of practice-oriented educational research that resulted in this dissertation. Since January 2021, Suzanne works as a postdoctoral researcher on educational innovations with ICT in higher engineering education at the Eindhoven School of Education at Eindhoven University of Technology.

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Practice-oriented educational research is scientific research emanating from and being conducted in educational practice with collaborative involvement of relevant stakeholders, and building on and aiming to contribute to both educational research and practice. Quality and impact are two central issues in discussions on practice-oriented educational research. By studying quality and impact as bifaceted and in relation to each other, this dissertation aims to increase conceptual understanding and identify how quality and impact can be actualised. Four qualitative studies are conducted. Three studies are conducted in the context of the Postdoc-VO project, in which science teachers in secondary education with a doctoral degree conduct practice-oriented educational research in their schools. In interviews, individual reflections and group discussions, ten postdoctoral teacher-researchers are questioned about quality and impact. The results reveal how teacher-researchers' quality concerns for practice-oriented educational research differ from research perspectives in the literature. Furthermore, the results empirically substantiate a literature-informed conceptualisation of the impact of practice-oriented education research in the dimensions scope, nature and progress. Subsequently, this conceptualisation is applied to analyse how impact, as reported by key stakeholders, relates to the characteristics of the studies, identifying how researchers can design their studies for impact. In the fourth study, six experts from the Dutch community of practice-oriented educational researchers are interviewed about the interrelatedness between quality and impact. This interrelatedness appears intertwined with conceptualisations of and judgements about (the configuration of) quality and impact. In actualising quality and impact of practice-oriented educational research, it seems indispensable to explicate underlying perspectives.