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# General conclusion and discussion

## Connecting practice-based research and school development. Cross-professional collaboration in secondary education

### Introduction

Collaboration between practitioners and researchers can increasingly be observed in research and development (R&D) projects in Dutch secondary schools. The underlying idea is that collaborating on practice-based research in schools can contribute to professionalization of teachers, to supporting and justifying innovations in schools, and to a research engaged culture in schools (VO-raad, 2014). However, little is known about how educational professionals learn in this context, under which conditions practice-based research can be used to inform school development, and what actions school leaders can take to encourage research engagement in their schools. The aim of this dissertation was to obtain a better understanding of processes and output of such R&D projects in which practice-based research and school development were connected and in which cross-professional collaboration between school leaders and teachers on the one hand, and researchers, advisers, and supervisors on the other, plays a major role. In this study practice-based research was in this study seen as aiming for generating useful knowledge on and for educational practice, in particular for the setting in which it is conducted (Broekkamp & Van Hout-Wolters, 2007; Coburn & Turner, 2012; Oancea & Furlong, 2007). School development was referred to as the activities in a school that aim at improving educational practices, such as alterations in teaching practice and changes in the structure and culture of the whole school organization (Massel, Goertz, & Barnes, 2012; Slegers & Leithwood, 2010; Walter, Nutley & Davies, 2005). The R&D projects were implemented as part of a funding scheme that corresponds with a bottom-up policy approach noticeable more often in recent decades in Europe and the United States (Crossley, 2013). In this policy approach, the needs of schools in teaching and learning issues are driving research goals because practitioners are given greater input in research than is usually the case in research funding. Examples of research in the context of R&D projects in schools are, for instance, monitoring an innovation aimed at the use of ICT in classrooms by using student questionnaires; evaluating lessons of teachers who changed their teaching methods through observations; and determining the impact of playing games during lessons by measuring student results.

The main research question of this dissertation was as follows:

*What processes and results occur in the context of cross-professional collaboration of school leaders and teachers with educational researchers, advisers, and supervisors in R&D projects in secondary education in terms of learning by participating professionals, school development, and the encouragement of research engagement in schools?*

A multi-case study design was chosen and in total nineteen R&D projects in secondary schools were investigated (Yin, 2009). Data were gathered by semi-structured interviews with project participants, project documents and meetings of professionals involved in the projects.

In this chapter, the main findings and conclusions of this dissertation will be presented, followed by a reflection on the theoretical contributions, methodological considerations, and limitations of this study. In the final section, the implications of the findings and conclusions for school practice will be discussed.

## **Summary of the main findings and conclusions**

### **Characterizing cross-professional collaboration**

The study presented in chapter 2 provided insight into the characteristics of cross-professional collaboration between school leaders, teachers and educational researchers and/or advisers in R&D projects in Dutch secondary education. Cross-professional collaboration was defined as a process in which the various participants involved come together for a diversity of reasons to achieve project goals by directing, guiding and performing research and development activities and through mutual communication (Penuel et al. 2011; Van de Ven 2007; Wagner 1997). Three dimensions were derived from literature on collaboration in R&D projects and were used as a framework to identify differences and similarities in the way cross-professional collaboration was shaped.

The first research question was: What differences and similarities in cross-professional collaboration in R&D projects can be specified in terms of reasons for collaboration, the division of roles and tasks, and the communication structure? The first dimension – reasons for collaboration – concerned the reasons professionals had for starting cross-professional collaboration. In two-thirds of the projects, the researchers completely focused on the interests of the school. In a third of the projects, the external parties explicitly had additional academic or commercial interests. The second dimension – division of roles and tasks –

displayed variation in how development and research tasks were distributed among the participants, such as who was directing and guiding the project. Occasionally, educational practitioners and educational researchers took over each other's tasks and roles as experts in the development and/or the research activities. In these cases, the term cross-professional can be literally applied, as they were crossing the boundaries of their professions. The third dimension – communication structure – demonstrated differences in the frequency of encounters, which was reflected in a lower or higher amount of time invested by the professionals.

The second research question was: What types of cross-professional collaboration can be derived from these differences? Four types of cross-professional collaboration were identified: (a) School-directed collaboration; (b) School- and researcher-directed collaboration; (c) School- and adviser-directed collaboration; (d) Researcher-directed collaboration. Schools and external parties shaped cross-professional collaboration differently, and these differences were mainly determined by which professional (school leader and/or researcher) directed and guided the research and/or development in the project.

### **Learning through boundary crossing**

The aim of the study presented in chapter 3 was to create a better understanding of the learning by professionals who were crossing boundaries, as they were involved in cross-professional collaboration in R&D projects in secondary education. In this chapter, schools and research institutes were identified as activity systems; community members of such a system work with certain tools on specific objects (Engeström, 2001; Wenger, 1998). Boundary crossing of professionals in R&D projects was defined as a process in which they encounter tools and objects that are common in other activity systems and, as a result, have the opportunity to expand their professional ways of working (Hora & Miller, 2011; Roth & Lee, 2007).

Boundary crossers' learning was interpreted in terms of learning mechanisms (Akkerman & Bakker, 2011):

- *Identification*: This is the case when school leaders, teachers, and researchers become aware of the peculiarities of the practice of 'the other' and how it differs from their own practice.
- *Coordination*: Characteristic of school leaders, teachers, and researchers who illustrate their work in the project as temporarily using both tools and objects from 'the other' activity system and their own, without resulting in real changes in the way they do their own work.
- *Reflection*: This is the case in which school leaders, teachers, and researchers

make perspective (i.e., understand and have knowledge of the other and their activity system) and take perspective (i.e., take the other into account, with respect to their own activity system). They are using their new perspective when they are collaborating.

- *Transformation*: Characteristic of school leaders, teachers, and researchers who expand their professional ways of working with new tools and objects of the other activity system.

The first research question was: Which learning mechanisms are characteristic for boundary crossers in collaborative R&D projects? About half of the school leaders' and teachers' learning mechanisms and those of most researchers were characterized as *transformation*. By performing research in their schools and engaging other colleagues in participating in research, school leaders and teachers expanded their professional ways of working with tools and objects that are typical for research. These school leaders started using tools and objects of researchers as well. They mentioned taking decisions in a more systematic, substantiated way, for example, when they were evaluating an innovation in school by analyzing collected data. The teachers, usually having a role as teacher researchers, mentioned, for example, using test scores for analyzing student progress and developing a more critical stance towards school issues more generally. The researchers whose learning mechanisms were characterized as *transformation* became 'practice-engaged'; they were increasingly able to identify with the schools' objectives, namely providing conditions for good education, and the teachers' tools, such as being aware of the complexities of classroom interactions. They came to see research and development as interwoven processes and got involved in decision-making processes in the school.

The second research question was: How are types of cross-professional collaboration and learning mechanisms of boundary crossers related? Distinct combinations of learning mechanisms occurred in different type of collaboration. Especially in the type of collaboration in which a school leader and a researcher jointly guide and direct the project (school- and researcher-directed collaboration) *transformation* was characteristic of school leaders, teachers, as well as researchers. *Transformation* was also characteristic of school leaders and teachers in school-directed collaboration.

## **Interplay between practice-based research and school development**

A recurrent discussion in the field of education is how to build linkages between educational research and school practice. The aim of the study displayed in chapter

4 was to obtain a better understanding of how a productive interplay between practice-based research and school development is established in the context of R&D projects in secondary education.

The first research question was: What types of changes occur in schools that are informed by practice-based research performed in R&D projects in secondary education? The results showed that professionals in thirteen of the nineteen projects used knowledge derived from research performed in the projects to inform practical and conceptual changes in school practice. Research in the projects was directed at one or more of these three domains: an innovation in the school, teachers' professional development, and/or the school organization as a whole. Practical changes in schools involved alterations in the design of an innovation, course or program, whereas conceptual changes concerned a better understanding by the professionals of the issues on which research was conducted.

In the second research question the focus was on the organization of feedback in the projects: How is feedback from practice-based research to school development organized? The results indicate that feedback was organized in two ways: short-term and long-term feedback loops. Short-term feedback loops occurred when professionals met each other frequently (once a week or month) and these feedback loops encouraged professionals to quickly adjust a program or intervention in schools. Long-term feedback loops occurred when professionals met each other two or three times a year with a prominent position for the last meeting of the year, at which results were shared and discussed.

The third research question was: Which conditions contribute to a productive interplay between practice-based research and school development? A productive interplay, in which practice-based research informed school development, was found in thirteen of the nineteen R&D projects. These concerned both projects with short-term feedback loops as well as long-term feedback loops. Characteristic for a productive interplay was not the feedback itself, but closing the feedback loop by having discussion and reflection on the meaning of research results for school practice. This seemed to be more often the case with short-term feedback loops as results are more frequently available during the school year. Additionally, essential for a productive interplay appeared to be more practical issues, for instance making clear agreements on communication and on the division of roles and tasks, such as timing the moment when research results become available in such a manner that they can be taken into account for decision-making for school development.

## **School leaders encouraging and integrating research engagement in schools**

The aim of the study in chapter 5 was to explore to what extent and how school leaders who participated in an R&D project with their school, used the project to encourage and integrate research engagement in their schools. The term research-engaged schools was introduced by Handscomb and MacBeath (2003). They concentrated on schools in which school leaders are aware of research taking place in school and stimulate teachers to take a critical stance, pursue their curiosity, and be informed by research in their daily work routine.

The results in this study show that school leaders differed in the scope of their ideas and actions regarding research engagement and in the stage of integration of research engagement in their school. As to the scope of their ideas and actions, about half of the school leaders mentioned encouraging a reflective attitude of teachers as well as facilitating teacher research. Their scope in encouraging research engagement encompassed all levels of the school (whole school, teams, and individual teachers). The other half of the school leaders had ideas about and took actions to promote a reflective attitude of teachers, as a way of improving teaching practice and school development. As to the stage of integration, one-third of the total group of school leaders had already integrated research engagement in their school. One of the actions of these school leaders was, for instance, organizing recurrent meetings in which teachers were discussing research results. Almost two-third of the school leaders developed interest in research engagement during the R&D projects and started to act upon this.

## **Overall conclusion**

The results show that there is not one single type of cross-professional collaboration in R&D projects, but that professionals shaped collaboration in different ways. The project participants varied in their reasons for collaboration, divisions of roles and tasks, and communication structures in the projects. The four distinguished types of cross-professional collaboration demonstrate that in some projects the professionals carried out their usual role, in which school leaders and teachers were guiding and directing the development tasks and researchers the research tasks. There were also projects in which both parties (schools and researchers) shared guiding and directing tasks and responsibilities.

Professionals from schools and from universities and research and advisory institutes became acquainted with one another and their respective worlds through cross-professional collaboration. Some of these professionals began to think in terms of the goals of the other world and to use the tools of the other. As a result, they enriched their own practice; for example, some teachers developed

a research attitude and started evaluating their teaching practices critically using questionnaires for their students to complete. Some school leaders started to make decisions based on research results on innovations in school or on a program for the professional development of teachers in which research engaged working is included. Researchers became more 'practice-engaged', when they became more aware of the complexities of educational practice and got involved in making decisions about teaching and learning issues that were relevant for the schools.

The idea behind these R&D projects was to perform practice-based research in schools that would contribute to the implementation of improvements in school practice. This goal was achieved in most projects. A condition for a productive interplay was to make clear agreements on who would conduct which research and development tasks and when they would be conducted. In addition, the closing of the feedback loop appeared to be an important condition. This was done by sharing research results with teachers and school leaders and by stimulating discussions with each other on what this means for school practice. For this it is necessary to tune into the pace and stages of practice-based research and school development in a way that makes clear when research results will be ready to share and can actually be used in decision-making in school development.

The R&D projects provided school leaders with the opportunity to encourage research engagement of teachers. Two main interpretations of research engagement were seen: encouraging a reflective attitude of teachers, by discussing and reflecting on research results, and facilitating teacher researchers to perform research in school. Integrating research engagement in school may result in a school organization, in which it is common to have teaching and learning practices continuously informed by research.

## **General discussion**

### **Theoretical contributions**

#### ***Cross-professional collaboration***

This dissertation contributes to the debate on closing the gap between the academic research field and school field. By introducing the term "cross-professional collaboration," emphasis was put on the possible cross-pollination when professionals with different backgrounds and motives come together. By analyzing data on collaboration – using the three dimensions, reasons for collaboration, division of roles and tasks, and communication structure – suggestions presented in earlier studies on cross-professional collaboration in R&D projects were empirically validated. The results indicate, for example, that cross-professional

collaboration takes different shapes that are partly comparable with the types of collaboration that Wagner (1997) elaborated. He emphasized that researchers think differently about research approaches and research tasks and that this difference would influence collaboration. Van de Ven (2007) presented ways for researchers to collaborate with schools, in what he called engaged scholarship, to provide teachers with a greater than usual say in research and provide them with a larger participation rate in research. The notion of educational researchers and school practitioners who bring in their own visions on research as they collaborate was examined by Vanderlinde and Van Braak (2010). The main conclusion they draw is that collaboration between educational researchers and teachers in practice-based research and professional learning communities can contribute to disseminating research results and to the application of results by teachers. In this light, it is important for both parties to communicate goals and strategies to obtain a shared context and commitment to the project, as argued by Coburn and Stein (2010). In the cross-professional collaboration in the studied R&D projects in this dissertation, great importance could be attributed to communication, for example, making appointments and meeting each other regularly, to help professionals adjust their goals and express their wishes. The dissertation also builds on the study of Nutley et al. (2008) on forms of research use by practitioners in interaction with researchers, and Penuel et al. (2011) on how researchers and teachers can work in a collaborative endeavor in design-based research. This dissertation shows the different ways of shaping cross-professional collaboration and what this means for the professionals involved, for instance, on the issues of providing feedback based on research results, arranging meetings, and mentioning purposes of research (McLaughlin & Black Hawkins, 2004; Ormel et al., 2012). Thanks to the collaboration, a relationship among researchers, school leaders and teachers can exist, in which they all gain a better understanding of each other and their backgrounds and goals for the research, as studied before by Edwards (2012) and McLaughlin & Black Hawkins (2004).

### ***Boundary crossing***

Boundary crossing appeared to be a useful concept to study learning by professionals in R&D projects, as was also indicated by Hora and Miller (2011). The learning mechanism of *transformation*, as mentioned by Akkerman and Bakker (2011), is the most far-reaching way of learning by crossing boundaries. The school leaders and teachers whose learning mechanism was characterized as *transformation* developed a research attitude and started analyzing data they collected. Researchers became engaged in decision-making processes on

issues concerning the teaching and learning of students. The results on shifting roles and tasks by crossing boundaries confirm studies in other contexts, such as that of Max (2010), who described several student teachers who became co-creators and co-researchers in projects in their schools with colleagues. Learning through boundary crossing appeared to enhance understandings of each other's tools, objects, and motives, which corresponds to the conclusions in a study by Tsui and Law (2007) on collaboration between teachers, student teachers, and university researchers. This dissertation particularly demonstrates further insights into the contribution boundary crossing has for school leaders, teachers and researchers in transforming their professional ways of working with tools and objects that are typical for research respectively teaching. School leaders were taking decisions in a more substantiated way, teachers were developing a more critical stance towards school issues, researchers were identifying with the objective of improving teaching and learning.

### *Practice-based research and school development*

The findings of this dissertation indicate that conditions are available in the context of cross-professional collaboration in R&D projects to connect practice-based research and school development. To have school leaders and teachers actually use research results, Coburn and Turner (2012) argued for not only focusing on the activity of using research results itself, but rather on how these activities alter regular patterns of working. In this dissertation, ways of organizing feedback based on research were described, which can be considered as such a new pattern of working. It was shown that both short-term and long-term feedback loops occur, both in which it appeared essential to close the feedback loop of research to school development. Short-term feedback loops occur when professionals meet each other often (once a week or month) and adjust a program or intervention in school rather quickly with the use of knowledge and insights provided by research. This is similar to the iterative processes of research and school development described in earlier studies (Bauer & Fisher, 2007; McKenney & Reeves, 2013); research results contribute to new insights for school development, which leads again to new research questions, and so on. Long-term feedback loops occur when professionals meet two or three times a year and organize a final meeting at the end of the year in which the meaning of research results for school practice are discussed. Earlier studies showed that it is also important to translate research results to practice in close consultation with one another (Baumfield & Butterworth 2007; Oancea & Furlong, 2007).

### *Encouraging research engagement*

This dissertation contributes to a better understanding on how school leaders can encourage and integrate research engagement in school, for instance by facilitating teachers to collaboratively discuss results of research. Not only school principals, but also middle managers and office administrators were active in facilitating teachers to collaboratively discuss and reflect on what research results mean for their own teaching practice. They were also facilitating cross-professional collaboration with external researchers, advisers, and supervisors, as a way of providing research expertise in the school. Other studies, such as Anderson, Leithwood and Strauss (2010) also indicated that school principals were in the key position to facilitate data use or use of research. In this dissertation it was seen that most school leaders grasped the opportunity to integrate research engagement in their school, for example by organizing recurrent meetings to discuss results (cf., Spillane et al., 2011). This was also elaborated on by Handscomb and MacBeath (2003) when they mentioned positioning research and inquiry at the heart of the school. It all starts with school principals or other persons with formal managerial or leadership roles and responsibilities who become aware of the possible extension of research engagement towards a larger group of teachers in school.

### **Methodological considerations**

The results in this dissertation are based upon an analysis of a large amount of qualitative data collected in nineteen R&D projects. The multi-case study design formed a suitable approach in light of the research questions and research purpose. This research design resulted in an in-depth exploration of the R&D projects and a rich understanding of the purposes, processes, and output in and of these R&D projects, from the perspective of the professionals involved in the projects. Attention was thereby paid to the individual and collective sense making of the professionals (Guba & Lincoln, 1994; Yin, 2009).

In this study, a variety of forms of data collection were utilized to pursue triangulation: semi-structured interviews, document analysis, and analysis of meetings in which professionals shared knowledge and results. This information was systemically gathered in a longitudinal design. Data were acquired on several occasions; for instance, interviews were conducted in four rounds spread over the project period. Triangulation was also achieved by interviewing a mixture of project participants. The semi-structured interviews were taken not only with school practitioners but also with educational experts who worked at a university, research or advisory institute. In this dissertation, the experiences of the different professionals involved were included; their perspectives may differ. In chapter 5, the data analysis was concentrated on school leaders in their roles as project

managers or school principals to investigate their experiences encouraging research engagement in schools.

The analyses of data in all sub-studies were conducted by making use of within-site matrices, whereby information in these matrices contributed to the formation of cross-site matrices (Miles & Huberman, 1994). Taking these steps in the analyses was helpful in providing insights in single cases and overviews in multiple cases. A form of audit was employed in every study presented in this dissertation. The research team considered all the steps in the process of analysis and its results. The first author conducted coding and analysis. The research team reconstructed the phases in the analyses and when different perspectives on results and conclusions led to debate, primary data were rechecked. Finally, a profound discussion in the research team contributed to making balanced decisions about data analysis and results, which lead to the conclusions in the studies.

### **Limitations and future studies**

Three limitations of the dissertation need to be taken into account when interpreting the results.

A first limitation is that all the studied R&D projects were launched and financed in the context of the same funding scheme. One of the aims of the funding organization was to enhance the exchange of knowledge between the academic research field and the school field to stimulate school development. The aims of the funding scheme can be seen as a stimulant for professionals to cross boundaries and for school leaders to encourage research engagement in schools. This has obviously influenced the approach chosen by the professionals in the projects. Therefore, the results cannot be literally transmitted to other settings in which researchers and practitioners collaborate. Future studies on practice-based research and school development in contexts other than funded R&D projects should demonstrate whether the same conditions apply and results occur.

A second limitation is the extent to which the context of the school was taken into account in the study. To a limited extent, certain issues in the involved schools were considered, such as communication structures in schools, cultures of professional learning among colleagues, or policy plans on the professional development of teachers. In future studies, it would be interesting to collect more data on characteristics of schools, such as by using information from reports of the Inspectorate of Education, and on conditions in schools, such as learning possibilities for teachers and support among teachers for change.

A third limitation relates to the character of the multi-case study design. Nineteen R&D projects were investigated. Because of the relatively large number of cases, less attention to detail on processes and outputs of collaboration was

paid, which would have been the case if one or two case studies were studied. On the other hand, the comparison of multiple cases allowed for exploring patterns in the projects, such as types of collaboration and learning mechanisms and conditions for a productive interplay. This would not have been possible with only a few cases.

### **Implications for practice**

The study shows that collaborating in an R&D project can help to bridge the gap between academic research and school practice. For realizing a productive interplay, in which research actually informs changes in school practice, it appeared to be crucial to close the feedback loop between research and school practices. This implies that teachers and school leaders have to invest time and energy in using and interpreting research, and reflect on the contribution it may have for school practice. It implies that researchers have to shift their perspective from questions that are considered important in the context of academic research to teaching and learning issues that are important for the school. It is also recommended to pay attention to the learning of professionals as they collaborate in projects; they might learn from each other and their respective worlds. By crossing boundaries between research and school fields, professionals can learn to enrich the way they fulfil their roles and tasks. By adopting a research attitude a teacher can work more systematically on improving his/her teaching. By becoming more 'practice-engaged', a researcher can do work that better reflects the complexities of and that is more relevant for educational practice.

School leaders are in a crucial position in schools to encourage research engagement of their teachers who can collaboratively discuss research results and reflect on what these mean for teaching and learning issues in their school to further improve their practice. Other school leaders may learn from experienced school leaders when they provide them with advice about what actions can be taken to encourage and integrate research engagement in their schools.

### **Implications for policy**

In this dissertation, nineteen R&D projects were studied that were funded by an organization that had the aims that research would contribute to school development and would yield knowledge that could be shared in the education field. These aims fit in a broader tendency in the education field to close the gap of research and school practice. Research engagement of teachers and school leaders is a current theme, as demonstrated by recent inaugural lectures on this topic (Admiraal, 2013; Brandsma, 2011), by the rise of professional development schools in which teachers provide advice for student teachers when they conduct

their small-scale research, and by the fact that school leaders aim for professional learning communities in which learning by teachers is stimulated and facilitated. The research engagement of teachers is also encouraged by several grants which provide teachers with the opportunity to start a PhD (Dudoc; NWO) and by encouraging teachers to become teacher researchers who systematically evaluate changes in their own teaching practices or changes in their schools' organization (Cochran-Smith & Lytle, 2009).

The studied R&D projects demonstrate that a bottom-up policy approach in practice-based research can contribute to learning of the professionals involved and to informing and justifying school development. In the light of professionalization and a more research-informed practice in these schools, this policy approach suited well. A second aim for the funding scheme was that knowledge would be produced that could contribute to a knowledge base that is relevant for other schools. It is a challenge for policy makers how they can create conditions for research and development to realize both aims.

The insights arising from this dissertation support the starting points of the recently founded Dutch Funding Institute for Educational Research (NRO, 2015). The aims of this funding institute are to contribute to the connection of educational research and practice and to the improvement and innovation of school practice. Based upon the findings of this dissertation, continuous cross-professional collaboration of school leaders, teachers, and educational researchers should be encouraged. In this way, the professionals can use the time and space to get to know each other and their backgrounds well, which contributes to making clear agreements on for the aims of the collaboration, divisions of roles and tasks, and mutual communication. This is in line with the recent plea of the Dutch Commission Sector Plan Educational Sciences (Commissie Sectorplan Onderwijswetenschappen, 2015) for the formation of academic workplaces to be the context in which researchers and school practitioners will perform research collaboratively with questions that are relevant for educational practice as the starting point. When funding is provided for this kind of research, professionals from schools and from universities and research and advisory institutes can take further steps in the collaborative endeavor of developing forms of research that yield insights in teaching and learning while simultaneously contributing to actual improvements in the schools involved.