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

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Publication date

2015

Document Version

Final published version

[Link to publication](#)

Citation for published version (APA):

Schenke, W. (2015). *Connecting practice-based research and school development. Cross-professional collaboration in secondary education*. [Thesis, externally prepared, Universiteit van Amsterdam].

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CHAPTER 5

Encouraging and integrating research engagement in schools: the school leaders' perspective¹

Abstract

Interest in practice-based research in schools in collaboration with researchers has increased during the last decade. This development provides opportunities for school leaders to encourage research engagement in their schools. The aim of this study is to explore to what extent and how school leaders who participated in a research and development (R&D) project with their school, used the project to encourage and integrate research engagement in their schools. Interviews were conducted with twenty-eight school leaders who work in Dutch secondary schools and were involved in nineteen research and development (R&D) projects. A cross-site matrix with relevant fragments from the interviews was constructed to analyze their ideas, actions, and plans concerning encouragement and integration of research engagement in their schools. 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 were concerned with nourishing a reflective attitude of teachers as well as facilitating teacher research. The other half of the school leaders promote a reflective attitude of teachers as an impetus for teacher learning 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. They organized routines, such as recurrent meetings in which teachers were discussing research results. These school leaders were convinced that research engagement is important for school development. Almost two-third of the school leaders developed interest in research engagement during the R&D projects and started to act upon this. In discussing the results, it is proposed that experienced school leaders may assist other school leaders to become aware of how to encourage and integrate research engagement in their schools.

Keywords: School leadership; research engagement; practice-based research; teacher research; research and development projects

¹ This chapter is based on Schenke, W., Geijsel, F.P., van Driel, J.H., & Volman, M.L.L. (in preparation). Encouraging and integrating research engagement in schools: the school leaders' perspective.

Introduction

In many countries in the Western world, an increasing number of schools has or will become actively involved in educational research (Coburn & Stein, 2010; Earl & Katz, 2006; NAPDS, 2012; Schildkamp, Lai, & Earl, 2013). Interest in practice-based research in schools with the active participation of school practitioners and researchers has increased likewise (Admiraal, Smit, & Zwart, 2014; Cochran-Smith & Lytle, 2009; Van de Ven, 2007). Practice-based research is considered as research aimed at generating useful knowledge concerning educational practice. The local situation in schools is usually the focus point of the research questions (McLaughlin & Black Hawkins, 2004; Vanderlinde & Van Braak, 2010). In the Netherlands, several incentives and opportunities have been created for research in which the role of teachers and school leaders transcends the traditional 'being a respondent in academic research programs.' An example is the rise of 'professional development schools,' in which student teachers conduct small-scaled research supervised by both teachers from the school and teacher education institutes. Another example are practice-based research programs for which consortia of schools and researchers can apply (NRO, 2015; Onderwijsraad, 2011). The context of the present study are funded research and development (R&D) projects in schools in the Netherlands. The funding scheme of these projects aimed for direct connections of practice-based research in schools to school development, based on the idea that research results can inform school practice and contribute to improving teaching and learning.

Although in most cases, teachers are the ones who become actively involved in the research practices in schools, school leaders make the initial decisions and also decide on the continuation of participation in such R&D projects. The term 'school leader' is used in this study to refer to school principals or other persons with formal managerial or leadership roles and responsibilities. Literature on practice-based research indicates that school leaders can use such research for creating the structures and culture for research engagement as a long-term, sustainable improvement strategy (Godfrey, 2014; Krüger, 2010; Levin & Datnow, 2012; McLaughlin & Talbert, 2006). However, little is known about the scope of school leaders' ideas concerning involvement in practice-based research and their future plans concerning research in their school. The present study aims 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.

Theoretical background

School leaders' role in encouraging research engagement

Practice-based research in schools offers opportunities for school development, because it can stimulate individual and collective learning and increase the school's ability to improve teaching practice. Often, this is seen in the context of a professional learning community, which refers to a community of teachers who generate and share knowledge with the purpose to improve their school practices (Lieberman & Pointer Mace, 2008; Pareja Roblin, Ormel, McKenney, Voogt, & Pieters, 2014; Sackney & Walker, 2007; Slegers & Leithwood, 2010). Whether and how such opportunities for school development are actually taken up, largely depends on the actions of the school leader.

In the present study, we use the term *research engagement* as it was introduced by Handscomb and MacBeath (2003, p. 4): "The research-engaged school is one in which teachers believe it is in their interest, and in the interest of their pupils, to be critical of received wisdom, to be skeptical of easy answers, to have a desire for evidence and to foster 'aggressive curiosity'. It recognises that at every level there is a research of some kind already ongoing, and finds ways of supporting that endeavour and making it more rigorous, transparent and of value not only to the school itself but to a wider constituency. In the research-engaged school, teachers have confidence in the process and enjoy mutual support in exploring their thinking, scrutinizing their practice and taking good ideas further. Self-evaluation is then not an extra or an imposition, not undertaken to satisfy some external demand but integral to the day-to-day practice of school and classroom." Recently, Godfrey (2014) described a particular view on research engagement in schools connected to reflective practitionership (Schön, 1983): "knowledge stemming from research is not literally applied, but teachers reflect on research from the perspective of their professional judgment" (Godfrey, 2014, p. 10). This may result in the integration of new knowledge in their contextual and local understanding of practice, as argued for instance by Janssen, Westbroek, Doyle and Van Driel (2013).

In most cases, teacher research seems to support research engagement at the teacher level: the professional development of these teachers in terms of acquiring knowledge and skills for systematically evaluating their own teaching practices. However, results of teacher research can also be used to inform school development, for instance when new knowledge is shared with other teachers or researchers and, as such, results in changes in school organization (Cochran-Smith & Lytle, 2009; Handscomb & MacBeath, 2003; Zeichner, 2003). Zeichner (2003) put forward that, when performing teacher research, teachers need to be

able to focus on their own research interests. Cochran-Smith and Lytle (2009, p. 40) have made a useful definition of teacher research: "...the inquiries of K-12 teachers and prospective teachers, often in collaboration with university-based colleagues and other educators. Teacher researchers work in inquiry communities to examine their own assumptions, develop local knowledge by posing questions and gathering data..." Teacher researchers require a substantial period of time to work collaboratively on their research, to foster professional development and make them feel at ease with one another (Zeichner, 2003).

When considering participation in practice-based research, a first issue for school leaders is to decide whether and how this participation can add to teacher learning and school development. A second issue entails how to encourage research engagement in the school. Strategic efforts and actions are needed for that, for instance creating organizational conditions, such as opportunities for teachers for additional professional development, participating in decision making, and instigating new forms of collaboration in the context of the project. From the perspective of transformational leadership, as imperative for school development, this involves that school leaders should consider and foster ideas of teacher researchers to ensure that teachers feel respected and seen, and model a research attitude to teachers (Geijsel, Slegers, Van den Berg, & Kelchtermans, 2001; Leithwood & Jantzi, 2006). Extensive research has shown that school principals or other persons with formal managerial or leadership roles and responsibilities are indeed in the position to create appropriate opportunities for professional development of teachers, organizational conditions such as sufficient time, information, materials and build a supportive culture (Bryk, Camburn, & Louis, 1999; Huffman & Hipp, 2003; McLaughlin & Black Hawkins, 2004). However, the actions of school leaders concerning practice-based research in schools have hardly been studied. An exception is the study of Levin and Datnow (2012), who identified four actions of school principals that were useful in light of data use in school: Formulating goals that match with specific needs of the school; providing time for teachers to discuss data and change their teaching practices; stimulating teacher development in knowledge and skills; and building a culture of trust, collaboration and of data use. Another exception is the study of Anderson, Leithwood and Strauss (2010), who concluded that only a few of the twenty-seven principals in their study indicated actually taking action on conditions, such as providing data on students from the state and district and making time available for teachers to interpret and act on the evidence. The majority of the principals suggested having little control over when data from state and district would be available; school district leaders were seen as the ones who could provide data in

time and model how to use these data. These findings suggest it is important for school leaders to create opportunities to work with partners that have expertise in research and data use. This may be reached by creating a close collaboration with researchers, advisers, and supervisors from universities or research and advisory institutes (McLaughlin & Black Hawkins, 2004; Walsh & Backe, 2013). In such cross-professional collaboration, a diversity of professionals work together to reach project goals via guiding, directing and performing research and development activities and through mutual communication (Schenke, Van Driel, Geijsel, & Volman, in press; Wagner 1997).

Using a biological analogy and referring to his own experiences within the educational system of England, Godfrey (2014) argues for an understanding of the growth of a school research culture as an interconnected ecosystem. Four nourishing factors are described that school leaders should be aware of and working on: Systemic connectedness; leadership for knowledge creation; teaching as a research-informed practice; and the school as a learning organization. Taking these factors into account, school leaders need to consider “developing a culture of research engagement as a long-term, sustainable improvement strategy” (Godfrey, 2014, p. 1), for instance by integrating research into schools’ strategic planning. Following this line of thought, it is likely that schools differ in the extent to which research engagement is embedded and integrated in the school’s culture.

Differences in the integration of research engagement in schools

Schools may differ in the extent to which research engagement is embedded in school structure and culture. In earlier research, McLaughlin and Talbert (2006) explicated developmental levels of inquiry-based reform in terms of novice, intermediate and advanced stages of becoming teacher learning communities. These stages represent “qualitatively different ways of using data to improve school community practice with different degrees of effectiveness.” (idem, p. 30). In the novice stage, practitioners discover the value of data and how to use it as they experiment with inquiry-based work. In the intermediate stage, practitioners are able to manage data to use it, for instance, in identifying students’ progress. In the advanced stage, practitioners develop systems of managing data with inquiry integrated throughout all levels in schools (the whole school, subunit and classroom). Or, in the words of Handscomb and MacBeath (2003) a school in the advanced stage is a school where school leaders place research and inquiry “at the heart of the school, its outlook, systems, and activity.” (idem, p. 4). However, Godfrey (2014, p. 14) pointed out “Getting all the features of a research-engaged school in place may take several years and is likely to be a process of continual development.”

Moving towards the final stage of integrating research engagement in schools, new activities that are organized in school may become visible as routines, for instance, new forms of collaboration and participation in decision making on changes in schools informed by research (Coburn & Turner, 2012; Spillane, Parise & Sherer, 2011). One can think, for example, of a new arrangement between teacher researchers and quality assurance officers to consider research results for educational practice. Research shows that the organization of such new routines creates opportunities for participative and distributive forms of leadership (Brezicha, Bergmark, & Mitra, 2014; Copland, 2013).

Thus, it is interesting to know more about whether and how school leaders indeed are willing to encourage research engagement and integrate research in school practice and how their ideas, actions and future plans may differ given the extent to which integration of research engagement in school culture and structure has already been established.

Research question

Until now, hardly any attention has been paid to the perspectives of school leaders regarding the benefits of practice-based research in their schools for school development. In the present study, we therefore focus on those persons involved in funded R&D projects in schools with formal managerial and/or leadership roles and according responsibilities. We aim at an exploration of these school leaders' ideas and actions concerning research engagement in their schools. The research question is: *To what extent and how do school leaders use the opportunity of participating in an R&D project for encouraging and integrating research engagement in their schools?*

Method

Context of this study

In 2010, the Ministry of Education and the Dutch Council for Secondary Education initiated multiannual funding for R&D projects in secondary schools, for which school leaders could apply. The nominated schools received funding for research activities for one, two or three years. The school principal transferred part of the research budget to researchers, advisers, and supervisors working at universities, universities of applied sciences, teacher education institutes, and research and advice bureaus. These R&D projects in schools consisted of, for

example, implementing new digital material in lessons and examining how this worked out for students' learning; developing an instrument on literacy skills and measuring students' achievement; training teachers' pedagogical skills and observing changes in classroom.

Participants in the study

For the purpose of this study, interviews with twenty-eight participants with managerial and leadership responsibilities in the projects were conducted in the final year of the project period. In Table 1, information is provided about the interviewed school leaders and some general information about the projects. Twenty of these twenty-eight interviewed school leaders had taken the role of project manager in one of the nineteen R&D projects: seven of these twenty project managers had a function in their school as school principal, three as office administrator, and ten as middle manager (Note: in Project D, two school principals shared the role of project manager, which makes a total of twenty interviewed project managers). Dutch school organizations contain two levels in the management structure, with a school principal and assistant principals on the first level, and middle managers on the second level. Office administrators have managerial responsibilities and function as support staff for the principals. We intended to obtain additional information for the thirteen projects in which the project manager was an office administrator or middle manager. This was realized in eight schools where we acquired information on how research engagement was perceived and positioned in the school by interviewing the school principal or assistant principal who did not fulfill the position of project manager (see Table 1).

Data collection

School leaders were interviewed at their schools in a session of sixty to ninety minutes. The interviews were based on pre-structured interview guidelines containing questions about the following topics: the output of the project, their views on practice-based research in schools, research engagement in schools, their role, tasks, actions undertaken, and responsibilities as school leader regarding the research and development activities in school, their perspective on cross-professional collaboration among the professionals in the projects, and future plans and expectations on research and development in schools. A transcript was made of all interviews.

Additional documentation was collected, i.e., project applications, research reports, and reports of meetings in which experiences were shared between professionals of different projects. The purpose of collecting these documents was

to use them in the preparation of the interviews as well as in the analysis of the interviews as background information on the projects and the professionals.

Data analysis

We constructed a coding scheme, by using the interview guidelines and notions from the literature, for the purpose of analyzing the interview data (see Appendix for the coding scheme). We used MaxQDA (version 10), a software program for analyzing qualitative data, for coding the interview fragments.

▼ **Table 1** | General characteristics of the R&D projects

Project code	School locations **	External organization	Content of project	Participants in this study (interviewed in round 4)
Project A	1 school; 2 locations	Research bureau	Policy interventions in students' language and arithmetic skills; evaluation of students	- Middle manager* - Assistant principal
Project B	1 school; 1 location	University	Teachers develop and evaluate functioning of mind maps for students	- School principal*
Project C	1 school; 1 location	University of applied sciences	Develop instrument to measure teaching skills; evaluation of teachers	- Middle manager* - School principal
Project D	2 schools; 2 locations	Research and advice institute	Develop educational theory and methods model for teenagers' school; evaluation of pilots	- School principal * - School principal *
Project E	1 school group; 2 locations	University	Develop program for gifted students; evaluation of students	- Middle manager* - School principal
Project F	1 school; 1 location	University	Teachers develop teaching method for highly gifted students	- Middle manager* - School principal
Project G	1 school group; 4 locations	University	Develop instrument to measure reading skills	- Middle manager* - School principal
Project H	1 school group; 5 locations	University teacher education	Teachers develop teaching method for reading skills; evaluation of teachers' professional development	- Office administrator* - School principal
Project I	1 school group; 5 locations	University teacher education	Teachers develop teaching method for differentiating in classroom; evaluation of students	- Office administrator* - School principal
Project J	1 school; 1 location	University teacher education; research and advice institute	Teachers design teaching material; evaluation of students and teachers	- School principal *
Project K	1 school; 1 location	University of applied sciences; research institute	Implement games in lessons; effect evaluation of students	- Middle manager*
Project L	1 school; 1 location	Research and advice institute	Implement pilots for reaching for healthy students; evaluation of students	- School principal *
Project M	1 school; 1 location	University teacher education; research institute	Research on use of school exams protocol, evaluation of mentor program, and evaluation of alumni	- School principal *
Project N	1 school; 1 location	Research and advice institute	Implement program for authentic assignments for students; evaluation of students	- Middle manager* - School principal

▼ **Table 1** | Continued

Project O	3 schools; 3 locations	Research and advice institute	Teachers develop digital lessons; evaluation of students	- School principal *
Project P	8 schools; 13 locations	Research and advice institute	Insight into instruments showing effectiveness of learning-support resources	- Middle manager*
Project Q	1 school group; 3 locations	University of applied sciences; advice institute	Develop instrument to measure reading skills after reading lessons; evaluation of students	- Office administrator*
Project R	1 school; 1 location	University teacher education; university of applied sciences	Teachers develop their teaching skills; evaluation by teachers of teachers' professional development	- Middle manager*
Project S	1 school; 1 location	University of applied sciences; research bureau	Designing games and integrating games in lessons; evaluation of students	- Middle manager*

* = Project manager

** Several projects concerned more than one school; moreover, Project K and S took place in one school consecutively, and Project H and I in the same five school locations.

For the purpose of this study, we selected interview fragments for every school leader with a focus on three points: 1) their views and ideas on research and research engagement in their schools, 2) the actions they conducted to encourage and integrate research engagement research in their schools, and 3) the plans and expectations they expressed for encouraging research engagement and integrating research in the next year. The interview fragments were organized in a cross-site matrix with information for all school leaders on these three issues. In the columns of the matrix, we placed as a header the three focus points, and in the rows we entered the selected fragments of interviews per school leader (Miles & Huberman, 1994).

In the first step in the analysis of the interview fragments, we concentrated on the school leaders' ideas on and actions for encouraging and integrating research engagement in their school. We operationalized the issues of encouraging and integrating research engagement, with the literature and research questions in mind. We distinguished the following ideas for encouraging research engagement and corresponding actions:

- 'Encouraging a reflective attitude' was used to label interview fragments in which encouraging teachers to discuss and reflect on educational practice based on research results was mentioned.
- 'Encouraging teacher research' was used to label interview fragments in which encouraging teachers to perform research in school was mentioned (which involves, e.g., formulating research questions, making a questionnaire, collecting data, and discussing results). We distinguished the following ideas on integrating research in school and corresponding actions:

- 'Embedding research in school' was used to label interview fragments in which putting effort into integrating research in the existing school structure and culture was mentioned.
- 'Embedded research in school' was used to label interview fragments that expressed that research had already become integrated in school practices.

A second step in the analysis of the data was to determine for all school leaders (individual case analyses; Miles & Huberman, 1994) their ideas and actions concerning encouraging research engagement, and in what stage they were in integrating research in schools (i.e., whether they were in the process of embedding research in schools, had embedded research in their schools, or neither of these two possibilities). As a third step, we compared the school leaders (cross-case analyses) to establish similarities and differences in their ideas and actions. In the final step, we compared the interview fragments on future plans with ideas and actions of these school leaders, to check the assignment of the school leaders to the different categories. Future plans concern plans and expectations of school leaders about encouraging research engagement and integrating research in schools for the next year after finishing the project. Data from the documentation of the projects, for instance research reports, were used as background information for interpreting the fragments.

As a form of audit, the research team discussed all the steps in the process of analysis and their results. The author of this dissertation conducted the coding and analysis. By reconstructing the phases in analysis and following the same procedures, one of the other team members rechecked primary data and judged decisions made in coding, analysis, and results. As a final step in auditing, she and the first author confirmed most decisions made in this study and together they decided to illustrate each of the categories with the ideas and actions of the school leaders in one of the projects (Miles & Huberman, 1994; Yin, 2009).

Results

In almost all projects, school leaders had ideas about research engagement in schools and undertook actions in relation to these ideas. Two dimensions were noticed when comparing the interview fragments.

A first dimension between school leaders concerned whether or how the school leaders concentrated on encouraging a reflective attitude of teachers and on teacher research. It appeared the scope of their ideas and actions differed. Three groups of school leaders could be discerned in the data analyses: 1) focusing on

reflective attitude and teacher research, 2) focusing on reflective attitude but no ambition for teacher research, and 3) focusing neither on reflective attitude nor on an ambition for teacher research. A second dimension concerned whether school leaders were in the process of embedding research in schools. Two groups of school leaders could be discerned: 1) school leaders that mentioned that research engagement was already embedded in school practice when the project started; en 2) school leaders that mentioned that they were embedding research engagement in school practice during the project. In Table 2, we combined the two dimensions to group the school leaders, resulting in five categories.

In the next sections, each of the five categories is illustrated by school leaders in one project through descriptions of their ideas about and actions for research engagement, integrating research in schools, and their future plans for research engagement.

▼ **Table 2** | Scope of encouraging research engagement and stage of integrating research in schools by school leaders

		Scope of encouraging research engagement in school		
		Reflective attitude and teacher research	Reflective attitude, no teacher research	No reflective attitude or teacher research
Stage of integrating research in schools	Embedded	Continuous integration of research engagement throughout all levels in the school; school leaders in Projects B, C, J	Continuous integration of a reflective attitude by facilitating teacher collaboration with external researchers in the school's research; school leaders in Projects D, L, M	
	Embedding	Starting to encourage and embed research engagement throughout the school during the project; school leaders in Projects A, E, H, I, R	Starting to encourage and embed a reflective attitude by facilitating teacher collaboration with external researchers in the school's research; school leaders in Projects K, O, P, Q, S	Focusing on developing innovations with no aim for research engagement; school leaders in Projects F, G, N

Continuous integration of research engagement throughout all levels in the school

School leaders in three projects (B, C, and J) had clear ideas and undertook actions for continuing teacher research and also strived for a reflective attitude of teachers as part of the schools' research engaged culture. They mentioned they had put effort in embedding research in school right from the start of the project. We will illustrate this category by focusing on the school leaders in Project C (a principal and a middle manager who had the role of project manager).

The school principal in Project C grasped the opportunity of the R&D project with both hands by connecting his ideas on research engagement in school to the school's mission:

The mission of our school is 'the school as a journey of discovery', and working research engaged matches to that very well. We do not know how effective it is what we are doing, that is why we need research. With this project we were able to strengthen the processes we implemented in our school (Project C, school principal).

In the years prior to the R&D project, the school principal had already built a close collaboration with a researcher. During the project, the researcher supervised teacher researchers who formulated research questions and developed an instrument to evaluate the implementation of an observation tool in school. The middle manager—who was also the project manager—explained his ideas on practice-based research, which he shares with the supervisor from the research institute:

We are aiming for a research group that examines several quality aspects of our school and we could not manage that on our own. We needed external support for that and in our case our supervisor brought this in. Our collaboration with the supervisor reveals we have the same vision on research: you should perform practice-based research in school that is as close as possible with what the school is asking for, on current issues in school, with research expertise with teachers themselves (Project C, middle manager/project manager).

He illustrated what actions he took in considering the ideas of colleagues in research:

We noticed that everybody understands the importance of the research. The type of research, including the observation instrument they use when visiting each

other's lessons, is concrete for teachers. Moreover, it is very close to their practice, it answers to their curiosity. Actually this entails a research attitude of teachers, for instance, by asking how my colleague gives his lessons [on a certain subject]? And what does the other think of me? So this type of research appeals to them (Project C, middle manager/project manager).

Research engagement was a recurrent issue on many levels in the schools. The middle manager and the school principal in Project C both propagated a comprehensive view of research engagement in their school: a vision of practice-based research in school was embedded in the school culture, for instance, by sharing the vision during teacher meetings and meetings with other school leaders. The school had also become a professional development school during the project, which meant that teachers are provided with time to support student teachers in their small-scale research in school. In the interview, the middle manager mentioned that he stimulated a reflective attitude of teachers in their daily work. He communicated about teacher researchers who provided a good example to other teachers by critically asking questions about teaching practices in school. The middle manager modeled his research attitude as well, for example in meetings with teachers when discussing students' grades. He purposefully encouraged a trickle-down effect in school, which gave an impetus to certain routines in school:

While teacher researchers conduct research we have noticed some sort of snowball effect going on. The results are discussed broadly, not only with the school principal. The research group is now becoming an institute within our school. People know what the research group is doing and the research group is performing practice-based research. So, we perceive it is as a win-win situation as the work of the research group is naturally finding its way in the organization (Project C, middle manager/project manager).

He also noticed the results of this trickle-down effect:

For me this can be demonstrated by the fact that practice-based research is built-in in the professional development plan for the whole school organization. A framework comprising of research themes is set up and the research group will contribute to this by assuring the formulation of good research questions (Project C, middle manager/project manager).

Furthermore, research was included in the school policy plan that generally provides directions for teaching practices for the next year, but now also offered

a list of research themes that could be taken up by the project manager and his research team to formulate research questions. In the meantime, the project manager had a disagreement with the school board about facilitating teacher researchers, but he mentioned that his school principal is an advocate for practice-based research in school, so he expected the conditions for teacher researchers would be arranged.

The school principals in Projects B and J showed similar ideas and corresponding actions as those in Project C. Research was embedded by these school leaders and had a prominent position in school. For instance, meetings were organized in which teachers and researchers shared research results with other teachers. These were actual routines in school as teachers were used to the recurrent meetings in which they discussed and reflected on research results. The school leaders provided teacher researchers with time and space to meet and had ongoing contact with educational researchers in cross-professional collaboration. They made plans for arranging new funding for research, and explained the importance of continuing practice-based research in school for integrating a reflective attitude of teachers in their school organization.

Starting to encourage and embed research engagement throughout the school during the project

School leaders in five projects (A, E, H, I, and R) were in the process of research in their schools with the aim of developing teacher research activities and broadening a reflective attitude among a growing group of teachers. We will illustrate this process in Projects H and I.

An office administrator of a school group with five locations was the project manager of Project H and I. In Project H, five Dutch language teachers from the different school locations were trained and supervised by a researcher and became teacher researchers. These teacher researchers examined pedagogical approaches for literacy, applied these in their curriculum and evaluated their lessons. Project I involved ten teachers working at the five school locations who were also becoming teacher researchers. They investigated differentiation strategies in the classroom in close collaboration with a researcher.

The office administrator was accountable for her actions to the board of the group of schools. At the start of the projects, she was primarily focused on facilitating and supporting a team of teacher researchers who were performing design-based research. Some research activities were reading literature, designing lessons, conducting interviews, making questionnaires, and sharing knowledge and experiences during their meetings. School principals in the five schools

provided these teachers with time to meet each other every week. One of the principals declared being content with the professional development of teachers after a few years:

The best output was that teachers themselves became excited by the method of teaching, by deepening and enriching their teaching material, and by discussing this with each other (Project I, school principal).

The office administrator was not yet fully satisfied with the teachers in Project H:

The urgency to work with design research teams in the school is growing. Furthermore the awareness among teachers is there: everybody understands that by measuring changes in practice, it will contribute to more powerful changes to occur. But they do not really do it yet (Project H, office administrator/project manager).

School principals had the impression that school development in their schools was informed by practice-based research performed by the teacher researchers. In the second year, the office administrator realized that research engagement could be suitable for more colleagues in the schools. For the coming years, a new goal was to position research more prominently in the schools, as the office administrator explained:

For the forthcoming three years, we explicated in our school plan the ambition for a professional learning community in which research is one of the pillars (Project I, office administrator/project manager).

For this reason, she became active in embedding the experiences of teacher researchers in the school organization on different levels, for instance by including research in school policy plans and by striving to become a professional development school. Important in this light were the efforts to disseminate research results, experiences on research, and knowledge created by research to other teachers. In both projects, the school principals encouraged teachers to share good practices with other teachers who could learn from these experiences.

We realized that if you like to draw research engaged working in school to a higher level, we had to arrange support for teachers in the school and to bring in expertise from outside on the issues those teachers really needed (Project H, office administrator/project manager).

The other school leaders in Projects A, E, and R show quite similar actions on the idea of embedding teacher research and research engagement in school. Exceptional in these cases is the observation of the middle manager and assistant principal in Project A on the development towards a culture of research engagement in their school. The assistant principal of Project A mentioned: 'Without research I could state our school was not this far developed.' The middle manager who managed this project explained this:

The fact that there is a project team, that colleagues know of their existence, that they realize that the researchers are still present in our school, already for so many years. You can tell that people gradually get engaged in research. It is a culture change; I can notice this shift has really taken place. It is even visible in other places: the researcher got the question to explain teachers about how you can supervise and judge students' research (Project A, middle manager/project manager).

However, in this school the participating teachers and school leaders were not engaged in research outside of the project itself and it was not yet routine. Regarding this issue, the middle manager in Project A said: 'With some teachers it is in their system, but it is not in the system of our organization.' The school leaders in Projects A, E, H, I, and R were developing towards a situation in which research is embedded in their schools.

Continuous integration of a reflective attitude by facilitating teacher collaboration with external researchers in the school's research

School leaders in three projects (D, L, and M) were in a situation where research was embedded in their schools. They concentrated on the reflective attitude of a large group of teachers. They were not facilitating and stimulating teacher researchers, but were encouraging teachers to participate in research performed by external researchers.

The school principal in Project L had initiated a plan to pay more attention to interventions for enhancing the health of students and for language procedures in school. He asked external researchers to propose a research plan. After negotiating the research with the school principal, the researchers designed questionnaires to evaluate the lessons on special programs on health. Teachers were invited to reflect on the results with the aim of using it to achieve improvement in their lessons. The school principal had the idea that research was needed in school to measure the progress of students in health, to know what to emphasize and to continue improving his school:

I have noticed in the last two, three years, that we are expected more and more to write improvement plans based upon data, facts and different views. I think it is of significance to include the systematics of 'to measure is to know'. Accountability is important for schools these days. At every turn you have to come up with surveys, improvement plans, etcetera, but by doing this you can define very accurate where to put focus on for improving your school. That's why we welcome this (Project L, school principal/project manager).

In this school, they were used to teacher meetings in which teachers learned from each other by sharing knowledge on current teaching and learning issues. The school principal took action to put both themes that were central in the project on the agenda of these teacher meetings. Besides this, the school principal thought about encouraging his teachers to be reflective on what their students learn in their classroom as a follow-up of this project. In the meantime, he had the ambition to change the school into a professional development school.

The course of action demonstrated by the school principal in Project L was quite similar to that of the school leaders of D and M. The school principal and project manager of Project M said when asked about research engagement in school: 'What works is to keep it close to their practice and small.' She arranged trainings and peer reviews on how to give feedback to students to enhance their results, which was evaluated by researchers. This was a means to have teachers reflect on their teaching practices. The school principals in Project D invited teachers in special meetings to talk about innovations in school and critically think about them. One of the school principals in Project D elaborated on the developments in school:

We are in a transition period. Too many colleagues are still leaning back and are primarily busy with what is happening here and now in their classroom. But you can notice that people are starting to ask questions, such as how to tackle problems, or stand still by how we do things. Yes, it is a fresh wind that blows through our schools. The need to perform research: that is already seeded. We are now conscious of the sprout coming out (Project D, school principal/project manager).

Starting to encourage and embed a reflective attitude by facilitating teacher collaboration with external researchers in the school's research

School leaders in five projects (K, O, P, Q, and S) were in a process of embedding research in their schools by focusing on a reflective attitude among teachers, not by facilitating and stimulating teacher researchers.

Project K and S have taken place in the same school in a consecutive order (first one year of Project K, and then two years of Project S). In both projects, new educational games were implemented in curricula and courses and evaluated; in Project K, these were meant solely for the subject physics. At the start of Project K, the project manager, a middle manager in the school, saw developing and evaluating educational games as the primary goal of the project and had no intentions for teachers to be involved in research activities. The research was performed by researchers from a research institute and from a university of applied sciences. One teacher was an exception, and he participated due to his own passion for research. At the final meeting of the year in which the researchers and teacher presented the research, the school leaders noticed this broadened the horizon of the other teachers and inspired their curiosity.

Therefore, from the start of Project S, the school principal and middle manager had the desire to co-develop with the researchers a research approach that would be more connected to the teaching practice of several teachers instead of only yielding insights on games for one course. One of their major actions was to increase the number of teachers who would participate in the newly started research by opening up the invitation to all courses. Time was designated to ten teachers to participate in the research performed by the researchers. These teachers were supposed to develop games themselves and were actively involved in the evaluation of their lessons. During the initial meeting, the middle manager explained to the teachers that they had to critically evaluate their lessons for which they developed educational games on the basis of data that would be provided by the external researchers. The school leaders communicated to the teachers that they were supposed to obtain a researchers' perspective.

I believe it is the best stimulant for the teachers to develop good lessons for which they are enthusiastic and that the lessons will have revenues in the end. I think research is not the goal for the teachers. No, the question is what research provides them with and how they improve their teaching through modern and varied lessons with more impact [on students] (Project S, middle manager/project manager).

The school principal and middle manager were aiming to create a reflective research attitude in these teachers and were not aiming to have teacher researchers:

I believe our teachers have a research engaged attitude. The teachers who participate in the project are very inquisitive and ask themselves the question how to improve their lessons. They think over this issue and like to discuss it with others; they reflect on their lessons. Although that is different than working with a statistical software program, I think it is a research engaged approach they use (Project S, middle manager/project manager).

In the final year, the middle manager made plans to further increase the group of teachers to integrate games into their lessons because she thought these plans were easily linked to the school's vision of providing innovative and modern lessons, which parents were expecting at this school. She also mentioned it would match well with the curiosity of fairly new teachers because of the innovative aspect of gaming on which the research was focused. In the meantime, the school had become a professional development school.

The school leaders in Projects O, P, and Q also became aware of the broader trend to increase research engagement in schools during the project. They aimed for teachers' research engagement by having them participate in research performed by external researchers to reflect on educational practices. The middle manager in Project P explained how he motivated teachers to participate:

I think it stands or falls on how you take it into school. You have to do it with enthusiasm and with conviction. You should know very well what you are doing, because you ask a lot from people. So, I am convincing my colleagues, the coaches and teachers, that it is right what we are doing. We definitely have to put evidence on the table, in order to have people say to me 'Yes, this really works' (Project P, middle manager/project manager).

Focusing on developing innovations with no aim for research engagement

School leaders involved in three projects (F, G, and N) were concerned with innovation in their schools, but appeared not to aim for research engagement in school and were not putting effort into embedding research in schools. In these schools, research appeared to be loosely linked with the existing school structure. Researchers involved in Project N were performing practice-based research on the subject of the implementation of the curriculum on big picture learning. Some

teachers were respondent in this research and only a few teachers were involved in thinking over the research results as part of the project, which was interpreted as an experiment by the school principal:

In my view, the R&D project was a good opportunity to experiment with research engagement in school. We did not want to stimulate a research engaged culture in our school, but we wanted to facilitate those colleagues who were ready for this (Project N, school principal).

The school principal organized the project in close contact with one of his middle managers:

In the first year I was in the lead, but in the second year I delegated much more of the tasks to the project manager. I was tuning with him and together we made arrangements for professional development of teachers by facilitating them and by making time schedules (Project N, school principal).

Towards the end of the project, the school principal and middle manager lost attention for practice-based research in schools and stopped encouraging research engagement, as they were primarily focused on managing further school development. The school principal was rather skeptical about the results of the research; in retrospect, he would have liked to give more direction to the research question to make it narrower, more aimed at some parts of big picture learning instead of evaluating all aspects.

School leaders in Projects F and G also had concerns about the research results. In Project F, the project manager – a middle manager – was performing the research itself, but due to time constraints the research did not sufficiently progress. The school principal in Project G was fairly disappointed in the research, as it did not match her expectations; the researchers' goal of developing an instrument to measure the reading level of students and return results afterwards appeared to be different than the one of the new school principal, who was primarily concerned with the results of individual students. Due to miscommunication, teachers did not get a chance to reflect on research results concerning their own students because the results arrived in the next school year when these teachers already had other students.

Conclusion and discussion

In this study school leaders' perspectives on the development of research engagement in their schools were explored. The research question was: To what extent and how do school leaders use the opportunity of participating in an R&D project for encouraging and integrating research engagement in their schools? The majority of school leaders grasped the opportunity of the R&D project to encourage teachers to become more research-engaged. The school leaders differed on two dimensions: 1) the scope of their ideas and actions regarding research engagement and 2) the stage of integration of research engagement in their schools.

About half of the school leaders appeared to be encouraging research engagement of teachers, with a scope that encompassed all levels of the school. These school leaders were focused on encouraging a reflective attitude of teachers as well as facilitating teacher researchers to perform research. They mentioned the importance of teachers asking questions on their teaching practice, being critical and reflective on research results, performing research themselves or being involved in research performed by colleague teachers, student teachers, and researchers. Moreover their ideas were concerned with the organization as a whole: they expressed ideas not just concerning individual teachers for being research-engaged, but also about the importance of a community of teachers, and not just of those involved in the project, but also those who were not involved initially. Furthermore at plenary meetings they shared the urgency for performing research in school in the light of improving teaching practice. A main difference within this group of school leaders is the stage of integrating research engagement in their schools: embedding or already embedded. The group of school leaders who had embedded research in school was convinced that it is important to make continuous improvements in teaching and learning that are informed by research. As a result, they had developed routines in their school, such as putting research frequently on the agenda of teacher meetings and sharing research questions and results with teachers. These efforts show that these school leaders were aiming to integrate research not only in the school structure, but also in the school culture. The plans of these school leaders show that they were conscious that leadership is needed to sustain research engagement in school; they were thinking about new funding opportunities and were striving to continue cross-professional collaboration with educational researchers. The group of 'research-embedding' school leaders started to undertake similar actions as the group of school leaders who had already embedded research engagement in their schools during the years in which research and development activities were conducted in the school. These

school leaders in the first place recognized the opportunity for sharing research results with teachers in school who were not directly involved in research and development activities in the project. In the second place, they started to see the potential of teacher researchers as a modeling group for other teachers. These school leaders started to encourage changes in teaching practice in the whole school that were informed by research. They also started to include research engagement as an ambition in school policy plans and teacher development plans school. While school leaders who expressed that research was already embedded in the school at the start of the project undertook these actions during the whole project, the 'embedding' school leaders started doing this in the second or third year of the project. Most of the school leaders in both groups had future plans for their schools to become a professional development school, where teachers who are acquainted with educational research advise student teachers in their small-scale research, or already were designated as such.

The ideas on research engagement of the other half of the school leaders in this study had a scope that was narrower than the other half of the school leaders. They expressed the viewpoint that performing research is not a task of teachers, and that research expertise should stay with researchers. These school leaders did stimulate and facilitate teachers to reflect on their teaching practice by interpreting and discussing research results. For this reason teachers were stimulated to participate in research conducted by researchers. This participation was not intended to gain research skills, but to integrate new knowledge and insights of research in their practical knowledge concerning their teaching practice. Two steps can be distinguished in the actions of these school leaders: Firstly, school leaders agreed with external researchers to perform research that was close to the practice of teachers, and secondly, school leaders invited teachers to reflect on the results. One of the major actions of these school leaders was to organize meetings in which teachers discussed results and knowledge obtained by research, which were mainly presented by researchers. In the schools where research engagement was already 'embedded', such discussions of research and knowledge in team meetings were a routine when the project started. School leader who started 'embedding' research engagement in their school during the project, started to create new routines to encourage a reflective attitude of teachers. School leaders started to pay attention to letting teachers have a greater say in research questions and discussing results. Similar to the other school leaders who aimed at both a reflective attitude and teacher research, these school leaders also made future plans for their schools to become a professional development school. They also wanted to share research results with a larger

group of teachers than the ones who were involved in the project, and by doing so, stimulate more teachers to be research-engaged in order to improve teaching practice and learn from research.

A central conclusion from this study is that almost all school leaders considered practice-based research in itself not necessarily as a purpose, but more as a means for reflective learning of teachers and for informed decision-making in the school. School leaders who had already embedded research engagement in school were aware of this and used the project to continue these benefits. Other school leaders in this study became conscious of this potential of participating in an R&D project. It may also be useful for these school leaders when experienced school leaders advise them about what actions can be taken to integrate research engagement in their school.

This study shows that a lot of actions are needed for encouraging and integrating research engagement in school, such as facilitating teachers to collaboratively discuss results of research, encouraging teachers to learn from research, and considering ideas of teachers in choosing research themes. Although the study of Anderson et al. (2010) also indicated that school principals were in the key position to facilitate data use by teachers for students, they also concluded that school principals needed external expertise (in their case, that of school district leaders) to provide data in time and model how to use these data. These findings and our results indicate a need for more attention for professional development of school leaders, for instance by stimulating school leaders to collaborate and develop their leadership in order to actually make use of research results to inform their decisions on improvements in their school. In the present study, school principals, but also the middle managers and office administrators were active in facilitating cross-professional collaboration with external researchers, advisers, and supervisors. Another action often noticed with school leaders in the study was that they facilitated teachers to collaboratively discuss and reflect on what research results mean for their own teaching practice. This role of school leaders was also found in the study of Levin and Datnow (2012), although their results also show that besides school leaders, other actors and their actions, for instance teachers and school district leaders are important as well, as they may influence the actions of school leaders.

Almost all school leaders in the present study mentioned a development in their school that can be considered as a development towards a professional learning community (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006) in which research has a central position: teachers critically reflect on their teaching practice in close collaboration with other teachers and with the support and expertise of

researchers. This development may result in a research-engaged school community in which teachers collaboratively discuss and reflect on research, and share the responsibility to improve practice, as the study of McLaughlin and Talbert (2006) showed. As school leaders embedded research engagement in school, new routines in the school organization became visible, such as organizing recurrent meetings in which teachers discuss and reflect on research results (cf., Spillane et al., 2011). In this stage, research engagement may be present at all levels in school, through a trickle-down effect as our findings indicate. This was also meant by Handscomb and MacBeath (2003) when they speak of placing 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. This will probably take several years and includes actions in order to embed research in school. This final notion is also stated by Godfrey (2014) who emphasized the need for school leaders to be alert on continual development towards a research-engaged school. In future studies attention may be paid to changes over time of the ideas and corresponding actions of school leaders, as these may alter during the years, especially when the school participates in new practice-based research.

▾ Appendix

Coding scheme, used for analyzing interviews with school leaders

Code	Explanation
R&D project team	
Project team; development	Composition of project team on the issue of development: names and tasks of project participants
Project team; research	Composition of project team on the issue of research: names and tasks of project participants
Changes in project team	Changes in project team; expectations for next school year; ways of transferring knowledge to new project participants in case of changes in project team
Project activities and output	
Development activities	Progress in project activities on level of development and opinion on this issue; with attention to e.g. an innovation, professional development of teachers
Research activities	Progress in project activities on level of research and opinion on this issue; with attention to e.g. tests, questionnaires, analysis, and reports
Role of research in the project	Role of research in the project, for instance informing school development, and opinion on this issue
Output work floor	Output visible on the work floor for colleagues and students
Output organization	Output on the organizational level; new structures and routines
Ideological output	Output on ideological level; changes in thinking; what is learned
Reached goals	Goals reached for research and development
Embedding research in school	
Conditions	Conditions on personal, material, and financial level
Support in school	Support of employees for research and development project; creation of support
Knowledge dissemination	Knowledge dissemination and contribution to school development (internal dissemination) and to accountability (external dissemination)
Permanent place in school	Ways for ensuring research to obtain a permanent place in school organization
School leader's vision on research	
Vision on research, research engagement, performing research in school	Vision on research engagement, on who has to/can perform research in school: academic and/or school participants
Vision on research; goal and audience	Vision on practice-based research: enhancing academic knowledge and/or contributing to improvement of practice; audience for practice-based research (academic world and/or practice)
Vision of institute	Vision of school/institute on performing practice-based research in school; support on performing research
Cross-professional collaboration	
Reasons for collaboration in project	
Connection research institute-school	What connects research institute-school, e.g. research theme, previous history
Reasons for collaboration	Reasons for collaboration research institute-school in this project; interests of parties
Project goals	Project goals; research and development
Convergent or divergent reasons	Convergent or divergent reasons for collaboration and project goals; vision on development and research
Opinion on collaboration	Opinion on how collaboration research institute-school works out

▼ Appendix | Continued

Division of roles and tasks in project	
Role of school leader	Role, tasks, actions undertaken, and responsibilities of school leader in research and development
Role of project manager	Role, tasks, actions undertaken, and responsibilities of project manager in research and development
Role researcher/adviser/ supervisor	Role, tasks, actions undertaken, and responsibilities of researcher, adviser, supervisor in research and development
Role teacher (researcher)	Role, tasks, and responsibilities of teacher (researcher); training and time and space facilitations; capable of performing research
Communication structure in project	
Workplace researcher	Frequency of working at school or at institute by researcher
Contact person	Contact person at school for researcher
Time investment	Time investment in project in hours per week/month
Communication means	Means of communication between research institute-school: consultation, e-mail, phone
Advancing and restrictive factors	
Advancing factors	Factors that are seen as advancing success, concerning output, activities and conditions, and collaboration
Restrictive factors	Factors that are seen as restrictive for success, concerning output, activities and conditions, and collaboration
Plans and expectations	
Continuation of school development	To what extent is school development, for instance an innovation or program, continued next school year? Plans and expectations
Continuation of research in school	To what extent is research in school, for instance research engagement, teacher research, continued next school year? Plans and expectations
Continuation of cross-professional collaboration	To what extent is cross-professional collaboration between research institute-school continued next school year? Plans and expectations