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# Embedding inquiry-based practices in schools: The strategic role of school leaders

Femke Geijsel<sup>1</sup> | Wouter Schenke<sup>2</sup> | Jan van Driel<sup>3</sup> |  
Monique Volman<sup>4</sup>

<sup>1</sup>Radboud Teachers Academy, Radboud University Nijmegen, Nijmegen, The Netherlands

<sup>2</sup>Kohnstamm Institute Amsterdam, University of Amsterdam, Amsterdam, The Netherlands

<sup>3</sup>Melbourne Graduate School of Education, The University of Melbourne, Parkville, VIC, Australia

<sup>4</sup>Research Institute of Child Development and Education, University of Amsterdam, Amsterdam, The Netherlands

## Correspondence

Femke Geijsel, Radboud Teachers Academy, Radboud University Nijmegen, Postbus 9103, 6500 HD Nijmegen, The Netherlands.  
Email: f.geijsel@docentenacademie.ru.nl

## Abstract

The context of this study were research and development projects in Dutch secondary education, particularly funded by government to combine practice-based research with school development goals for inquiry-based culture. Aiming at better understanding of the strategic role that school leaders play in embedding inquiry-based practices in schools, the research question of this study was to explore to what extent and how do school leaders use the opportunity of participating in funded research and development projects for encouraging and integrating inquiry-based practices in their schools? Differences concerning the integration of inquiry-based working in the school as professional learning community were examined, distinguishing between school leaders' strategies of capacity building. Twenty-eight school leaders of Dutch secondary schools, involved in nineteen projects, were interviewed retrospectively. Analyses showed the majority of the school leaders to be convinced that inquiry-based working is important for their schools' development as a professional community. Their strategies for achieving school level project significance differed in school leaders' successive attention on personal or interpersonal capacity building with regard to inquiry-based practices. Moreover, while some school leaders were actively involved with capacity building right from the start of the research and development projects

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projects, almost two-third of the school leaders developed interest in inquiry-based practices during the projects and started to enact in the final year of the project. In discussing the results, it is proposed that the interaction of strategy and context needs further study, for instance to inform peer learning among school leaders that are novice and experienced in inquiry-based practices as a means to develop the school as a professional learning community.

## 1 | INTRODUCTION

Practice-based research aims at generating useful knowledge for practices in education; it contributes with analyses of the local situation in schools (Vanderlinde & Van Braak, 2010). Practice-based research has increased in recent years; collaboration between schools and researchers in this field has intensified (Admiraal et al., 2016). For teachers, it entails an opportunity for professional development: the development of inquiry-based practices; systematic reflection; reading and using research; conducting small-scale research on their own lessons (Van Schaik, Volman, Admiraal, & Schenke, 2019). More understanding is needed of how to position practice-based research and inquiry-based practices in the school organisation in the longer term (Coburn & Penuel, 2016; Marsh & Farrell, 2015). Practice-based research projects often involve teachers in organisational practices at school, for example in the interpretation of accountability data and by participation in school policy making. As such, practice-based research projects are considered to contribute to the development of schools as professional learning communities.

The role of school leadership in the development of schools as professional learning communities is crucial. In particular, the strategies chosen by school leadership to connect to the history and context of schools (Hallinger, 2018; Slegers & Leithwood, 2010). Accordingly, it is important to learn about school leaders' ideas concerning practice-based research and its meaning for the development of schools. The purpose of this study was to better understand the strategic role that school leaders play in embedding inquiry-based practices in schools. The study aimed also to understand the ways in which leaders used practice-based research projects for embedding inquiry-based practices in schools. We focused on projects that had received funding.

## 2 | CONTEXT OF THE STUDY

The Ministry of Education in the Netherlands has provided public funding for practice-based research in several waves. This policy incentive can be considered a reaction to the increasing gap between academic research and education practices experienced at the start of this century (Vanderlinde & Van Braak, 2010). Evaluation of a policy incentive for evidence-based small-scale innovation in schools, in 2007–2010, showed that innovations do not automatically scale-up (Schenke, Geijssel, van Driel, & Volman, 2017). The school's conditions for innovating and improving during the project, appeared to matter. Hence, in the follow-up program, the focus changed from innovation to research and development. Explicit goal setting for practice-based research among teachers was added to the goals for the development of the school as a professional learning community. The present study focused on research and development projects, funded in the period 2010–2014, in Dutch secondary schools.

The funding was coordinated by the Dutch Council for Secondary Education (intermediate to Dutch government and schools; cf. Waslander, Hooge, & Drewes, 2016). School principals could apply for funding after

choosing collaboration partners at facilitated meetings. The Dutch Council for Secondary Education monitored budgets for research and development; as well as a new indicator on principals' commitment to school development goals. The management structure of Dutch schools consists of three levels: (a) a board of directors supervise a number of schools, (b) school principal and assistant principals supervise individual schools, (c) middle-managers supervise units within schools. Office administrators at the board level have managerial responsibilities and function as support staff for the principals.

Nominated schools received funding for both research and school development activities for one, two or three years. Research and development projects consisted, for example, of implementing new digital material in lessons and examining the impact on student learning, teacher pedagogical skills and changes in classrooms. School principals participated as project managers or by transferring the project manager role to another member of the leadership team. School principals were allowed to transfer part of the research budget to researchers, teacher education institutes or other external consultants.

### 3 | THEORETICAL BACKGROUND

#### 3.1 | Inquiry-based practices in schools

Practice-based research offers opportunities for teacher learning and school development. Individual and collective learning as well as school capacity to improve teaching practices are stimulated (Cochran-Smith & Lytle, 2009; Van Schaik, Volman & Admiraal, 2019). Teachers are offered opportunities for professional learning; knowledge and skills for systematically evaluating teaching practices. In our evaluation of the impact of research and development projects on teachers in the Netherlands, we could see individual teachers gaining access to research knowledge. This helped teachers particularly with the development of diagnostic skills; to more thoroughly analyse underlying problems and the need for development (Schenke et al., 2017). Such deeper diagnosis is not only of use for the individual teacher but can be useful for improvement processes in the whole school. Moreover, research projects helped teachers to design "school-specific" products, such as lesson observation tools that fit well to their school practice.

Practice-based research projects enable "teacher researchers to work in inquiry communities to examine their own assumptions, develop local knowledge by posing questions and gathering data" (Cochran-Smith & Lytle, 2009, p. 40). Such inquiry communities in schools allow for a better use of school and student data to support both internal and external accountability. Moreover, an "inquiry habit of mind" is enhanced among teachers, ensuring that teachers use observation and analysis of practices to reflect on the role and actions of teachers. Sharing and appreciating an inquisitive attitude in schools can lead to the development of a professional culture that draws on inquiry (Earl & Timperley, 2009).

In sum, we took notice of five ways in which schools can benefit from participating in practice-based research, what we refer to as inquiry-based practices of teachers: (a) increased access to (academic) knowledge; (b) better analysis and diagnosis of problems in practices; (c) design of tools that were relevant for the context and operation of individual schools; (d) the use of research skills for informing accountability; and (e) the manifestation of an inquiry-based attitude among teachers (e.g., Baan, Gaikhorst, van 't Noordende & Volman, 2019).

#### 3.2 | The role of school leaders in embedding inquiry-based practices

Whether and how opportunities of practice-based research for supporting inquiry-based practices in schools are taken up does not depend only on teachers but also on school leadership. For school leaders, participation in practice-based research can entail collaboration with researchers and external advisors for informing policy

decisions in schools (Schenke, Van Driel, Geijssel, & Volman, 2016). School leaders take strategic efforts and actions for developing organisational conditions, such as opportunities for professional development and initiating collaboration in the context of projects (Penuel et al., 2017). From a perspective in which transformational leadership is imperative for school development (Slegers & Leithwood, 2010), school leaders model an inquisitive attitude; leaders should foster the idea of teacher researchers to ensure that teachers feel respected and recognised for inquiry-based work.

More research is needed on the use of inquiry-based practices and the actions, attitudes and strategies of school leaders for using practice-based research. Uiterwijk-Luijk, Krüger and Volman (2017) showed that leaders were able to promote inquiry-based practices in staff discussions about student outcomes and research outcomes. For using data in schools, Levin and Datnow (2012) identified four action points for school principals: (a) formulating goals that match school-specific needs; (b) providing time for teachers to discuss data and change their teaching practices; (c) stimulating the development of teachers knowledge and skills; and (d) building a culture of trust, collaboration and of data use. Focusing on creating conditions, Anderson, Leithwood, and Strauss (2010) concluded that only a few of the twenty-seven principals in their study had taken actions; such as provided data on students from the state and the district and made time available for teachers to interpret and act on the evidence. The majority of the principals suggested having little control with regard to availability of data; district leaders were seen as the ones who could provide data in time and model how to use these data.

Using a biological analogy, Godfrey (2016) argued for an understanding of the growth of a school research culture as an interconnected ecosystem and focused on the role of leadership within such ecosystem. School leaders should be aware of and work on four nourishing factors: (a) systemic connectedness; (b) leadership for knowledge creation; (c) teaching as a research-informed practice; and (d) the school as a learning organisation. Taking these factors into account, school leaders need to consider "developing a culture of research engagement as a long-term, sustainable improvement strategy" (Godfrey, 2016, p. 301), for instance by integrating research into the strategic planning of schools. In this perspective, it is likely that school leaders differ in their ways of integrating inquiry-based practices in school culture.

### 3.3 | Stages in embedding inquiry-based practices in schools

In earlier research, McLaughlin and Talbert (2006) differentiated the development of teacher learning communities into levels of inquiry-based practices; first the novice stage, then intermediate and more advanced stages, with integration as the final stage. These stages represent "qualitatively different ways of using data to improve school community practice with different degrees of effectiveness" (ibid, 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 student progress. In the advanced stage, practitioners develop systems of managing data with inquiry integrated throughout organisational levels in schools (the whole school, subunit and classroom). Moving towards the final stage of integrating inquiry-based practices in schools, new activities that are organised in schools may become visible as routines; for instance, new forms of research informed collaboration and participation in decision making on changes in schools (Spillane, Parise, & Sherer, 2011). Organising these types of new routines creates opportunities for participative and distributive forms of leadership (Brezicha, Bergmark, & Mitra, 2014).

When studying differences in the strategies for using inquiry-based practices among school leaders it is important to consider the above stages of capacity development in schools; also, the alignment of inquiry-based practices with the school as a professional learning community (Admiraal et al., 2016). A professional learning community refers to the community of teachers who generate and share knowledge with the purpose to learn from each other and to improve education practices. Such community builds on multi-level capacities within the school: personal, interpersonal and organisational (Mitchell & Sackney, 2000; Slegers, Den Brok, Verbiest,

Moolenaar & Daly, 2013). The personal professional field is the individual cognitive capacities of professionals. For example, the ability to actively and reflectively construct knowledge. The interpersonal level is the basis for knowledge sharing, it is about social capital among teachers: the ability of teachers to work and learn together. School leaders are responsible of the organisational level. Together with leadership that stimulates and supports participation, organisational structures enable teacher collaboration and their joint learning—for example, scheduling and team teaching—and the availability of resources. An example of the latter is the allocation of professional development opportunities.

As mentioned earlier, inquiry-based practices are known to have impact on both teacher learning and school development; with the school leadership being crucial for the school developmental part. A conceptual framework that distinguishes between different levels of the school as a professional learning community can help us to better understand the leaderships' views and actions regarding the benefits of inquiry-based practices. The question then is what kind of *capacity building*—promoting the personal, interpersonal or organisational capacity—is emphasised by school leadership.

## 4 | RESEARCH QUESTION

Until now, little attention has been paid to the perspectives of school leaders regarding the benefits of practice-based research for school development. The study on which we report sought to understand the ideas and intentions of school leaders in using inquiry-based practices. Our research question was: *To what extent and how do school leaders use the opportunity of participating in funded research and development projects for encouraging and integrating inquiry-based practices in their schools?* We examined whether and how school leaders were willing to encourage inquiry-based practices. Also, whether their ideas, actions and future plans differed in relationship to the extent to which integration of inquiry-based practices and the professional learning community approach had already been established. Moreover, we examined school leader strategies for capacity building on the personal, interpersonal and organisational levels.

## 5 | METHOD

### 5.1 | Study participants

We interviewed twenty-eight school leaders—school principals or other persons with formal managerial or leadership roles and responsibilities (Table 1). Interviews were undertaken in the last year that research and development projects received funding. The principal had transferred project management to a middle manager or office administrator in a number of projects. In such cases, both the project manager and the principal (A, C, F, G, H, I; and board chairman in E) were interviewed. However, in schools K, P, Q, R and S, the school principal was not available at the time.

### 5.2 | Data collection

School leaders were interviewed in a session of sixty to ninety minutes. Interviews were based on pre-structured interview guidelines containing questions about the output of the project; their views on practice-based research and inquiry-based practices in schools; their role; tasks; actions undertaken and responsibilities in research and development activities at school. Leaders were asked also about their perspective on cross-professional collaboration among participating professionals, future plans and expectations for research and development in schools.

**TABLE 1** General characteristics of research and development projects that had received funding

Project code	School locations**	Content of project	Participants in this study	Research collaboration preceding this project
A	1 school; 2 locations	Policy interventions in students' language and arithmetic skills	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• Assistant principal</li> </ul>	Yes
B	1 school; 1 location	Functioning of mind maps for students	<ul style="list-style-type: none"> <li>• School principal*</li> </ul>	Yes
C	1 school; 1 location	Instrument to measure teaching skills	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• School principal</li> </ul>	Yes
D	2 schools; 2 locations	Educational theory and methods model for teenagers' school	<ul style="list-style-type: none"> <li>• School principal*</li> <li>• School principal*</li> </ul>	Yes
E	1 school group; 2 locations	Program for gifted students	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• Chairman of the Board</li> </ul>	No
F	1 school; 1 location	Teaching method for highly gifted students	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• School principal</li> </ul>	No
G	1 school group; 4 locations	Instrument to measure reading skills	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• School principal</li> </ul>	Yes
H	1 school group; 5 locations	Teaching method for reading skills	<ul style="list-style-type: none"> <li>• Office administrator*</li> <li>• School principal</li> </ul>	Yes
I	1 school group; 5 locations	Teaching method for differentiating in classroom	<ul style="list-style-type: none"> <li>• Office administrator*</li> <li>• School principal</li> </ul>	Yes
J	1 school; 1 location	Design and evaluation of teaching material	<ul style="list-style-type: none"> <li>• School principal *</li> </ul>	Yes
K	1 school; 1 location	Implementation of games in lessons	<ul style="list-style-type: none"> <li>• Middle manager*</li> </ul>	Yes
L	1 school; 1 location	Implementation of pilots for reaching for healthy students	<ul style="list-style-type: none"> <li>• School principal *</li> </ul>	No
M	1 school; 1 location	Research on use of school exams protocol, evaluation of mentor program	<ul style="list-style-type: none"> <li>• School principal *</li> </ul>	Yes
N	1 school; 1 location	Program for authentic assignments for students	<ul style="list-style-type: none"> <li>• Middle manager*</li> <li>• School principal</li> </ul>	Yes
O	3 schools; 3 locations	Development of digital lessons	<ul style="list-style-type: none"> <li>• School principal *</li> </ul>	No
P	8 schools; 13 locations	Insight into instruments showing effectiveness of learning-support resources	<ul style="list-style-type: none"> <li>• Middle manager*</li> </ul>	No
Q	1 school group; 3 locations	Instrument to measure reading skills after reading lessons	<ul style="list-style-type: none"> <li>• Office administrator*</li> </ul>	No
R	1 school; 1 location	Teachers develop and evaluation their teaching skills	<ul style="list-style-type: none"> <li>• Middle manager*</li> </ul>	Yes
S	1 school; 1 location	Designing and integrating games in lessons	<ul style="list-style-type: none"> <li>• Middle manager*</li> </ul>	Yes

\*Project manager (note: in Project D, two schools joint in one project with their principals sharing the role of 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.

Source: Authors.

A transcript was made of all interviews. Additional documentation (i.e., project applications, research reports, and reports of meetings in which experiences were shared between professionals of different projects) were used in preparing each interview and was used in the analysis as background information.

### 5.3 | Data analysis

Interview fragments were first organised in a cross-site matrix. The columns had the main topics of the interview as headers. In the rows, we entered the fragments of interviews per school leader. Based on the interview guidelines and notions from the literature, we constructed a coding scheme. MaxQDA (version 10), a software program for analysing qualitative data, was used for coding the interview fragments.

Secondly, we labelled the interview fragments more in-depth in line with our theoretical framework (individual case analyses; Miles & Huberman, 1994), by focusing on school leaders' views on: (a) the role of inquiry-based practices in schools and their own actions with regard to this role, (b) the stage of integration of inquiry-based practices in schools and their corresponding actions, and (c) their strategies, intents and actions for using inquiry-based practices for capacity building (distinguishing between the three levels of capacities of the professional learning community). Data from the documentation of the projects, for instance research reports, were used as background information for interpreting the fragments.

In a third step, we identified interview fragments that underscored the importance of inquiry-based practices from fragments that expressed views of lesser or no-importance. Likewise, we identified school leaders' expressions on the stage of integration of research in school and its consequences for school leaders' actions, by distinguishing between embedded, in the process of embedding, or not interested in embedding inquiry-based practices in the school organisation. Moreover, we made a distinction between school leader ideas about the meaning of inquiry-based practices for the multi-level professional learning community capacities; distinguishing between strong expression, occasional interest and negligence.

Fourthly, a data-reduction matrix was established for the purpose of cross-case analysis using school leader positions from the third step of the analysis as well as the background information from Table 1. We first focused on crossing the labelled stages of integration with the five ways of inquiry-based practices, which showed an inconclusive pattern. We then used the labels for personal, interpersonal and organisational capacity building, showing a more conclusive pattern with interaction of the stage of integration (embedding/embedded) of inquiry-based practices in relation to the school as a professional learning community; as will be presented in the results.

The research team discussed all the steps in processing analysis and results. The second author of this article conducted the interviews, initial coding and analysis. The first author rechecked by reconstructing the phases in analysis, from procedures to judgments. The research team made analytical decisions together as well as decisions on the illustrative fragments in the result section. Their choices and decisions were then audited by the third and fourth author (Miles & Huberman, 1994).

## 6 | RESULTS

Table 2 shows an overview of the results, distinguishing four groups of projects and revealing two strategic tracks, deduced from the pattern analyses.

The school leaders in sixteen of the nineteen projects indicated that inquiry-based practices served the development of their schools. The capacity building strategy noticed in the interviews with the school leaders of these sixteen projects appeared to be divided into two tracks.



**TABLE 2** Grouping of projects according to stages of integration and strategic tracks

Strategic tracks of school leaders	Stage of integration	Projects
Track A1: Organized learning in school via teacher research	Embedded	B C J
Track A2: Organizing learning in school via teacher research	Embedding	A D H I S
Track B: Organizing for collective learning building on results of external researchers	Embedding	E K L M N P Q R
No strategic track	No embedding	F G O

Source: Authors.

In the following, we describe each of the strategic approaches, or tracks, with illustrations from interviews, first focusing on personal and internal capacity building, followed by notions regarding organisational capacity building.

## 6.1 | Organised and organising learning in school via teacher research

The strategic approach A, hereafter referred to as “track A” was characterised by school leaders from eight projects, all with earlier experiences with practice-based research projects (see Table 1). Track A leaders chose to put together an internal group of teacher researchers and to include an external researcher right at the outset of the project. In many cases, school leaders were participating actively in the internal research group as well. The formation of this internal research group was initially seen as a professional learning strategy in order to develop research skills among the participating teachers. School leaders thus focused primarily on developing teachers' personal capacity. The school leaders in this track were pleased with the development of the teachers, such as learning to formulate a research question, conducting a good research plan and evaluating it. In addition, conducting research by teachers at the school was seen as a way to get answers to school-specific questions or solutions to school-specific problems. In fact, the school leaders in track A recognized most of the five types of benefits of inquiry-based working in schools, including internal and external accountability (in track B the latter was not recognized). Six of the participating leaders expressed the value of the project in terms of increased manifestations of inquiry-based attitudes among teachers; the level of sharing of professional learning throughout the school nevertheless differed for the two subgroups within Track A.

## 6.2 | Building personal capacity embedded within interpersonal capacity

The A1 strategic approach, hereafter referred to as “track A1” was represented by projects B, C and J. In these projects, the teacher teams had already conducted practice-based research and the school leaders were aware from the outset that colleagues had to get involved in the research. School leaders focused on the research capacity of individuals and organised a connection with a group of teachers. This required relatively little effort because the interpersonal capacity for sharing lessons from school-based inquiry (wider than the initial research group) had already been established in these schools. Teachers were already used to routines that involved 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 education researchers in cross-professional collaboration. Two particular strategies emerged in these schools for communicating individual research to the professional community: (a) giving presentations about the research and (b) sharing education practices and tools, for instance an observation tool. The following interview excerpts from project C illustrate the A1 approach.

*The mission of our school is 'the school as a journey of discovery', and inquiry based working 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)*

*One 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. [...] 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)*

Inquiry-based practices were a recurrent issue in school leaders' actions on many levels in the schools, propagating a comprehensive view of inquiry-based practices connected to school culture. These school leaders modelled their own research attitude as well, for example in teacher meetings discussing student grades. The middle manager in project C, for instance, purposefully encouraged modelling of good practices through routines in school:

*While teacher researchers conduct research, we have noticed some sort of snowball effect going on. So, we perceive it is as a win-win situation as the work of the research group is naturally finding its way in the organisation. 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 organisation. 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)*

### 6.3 | Building on personal capacity followed by embedding in the wider team

The A2 strategic approach, hereafter referred to as "track A2" was represented by school leaders in projects A, D, H, I, and S. These projects stimulated research in their schools with the aim of developing teacher research activities and broadening a reflective attitude among a growing group of teachers, like the school leaders in projects B, C and J. However, the need to communicate within the professional community was understood as the project evolved, instead of being clear right from the start. In two projects (D and S), it was the school leaders' intention to pay attention to the team level from the start but the intention did not match their actions. The attention of the school leaders remained largely focused on the individual capacities within the internal research group. Later on in the project, this changed. The school principals in Project D for instance, invited research teachers in special meetings to talk about innovations in school and to critically think about them. One of them explained:

*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)*

In projects A, H and I, the focus on communicating the research of teachers to the larger team of teachers came up in the last year of the project. The school leaders saw the first indications of a growing awareness among colleagues of the usefulness of research at the end of the project. The project manager of projects H and I was an office

administrator of a larger school group with five locations. 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, with activities such as reading literature, making questionnaires, and sharing experiences in meetings. School principals in the five schools provided these teachers with time to meet every week. The project manager was not 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)*

In the second year of the project, the office administrator realised that inquiry-based practices could be suitable for more colleagues in the schools. Moving forward, a new goal was to position research more prominently in the schools:

*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)*

*We realised 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)*

## 6.4 | Increase of organisational capacity

A shared feature of tracks A1 and A2 included scheduling issues at the start of the projects. These were bottlenecks that school leaders had to overcome for providing teachers with sufficient time for the job whilst scheduling meeting times for the research project. All eight school leaders underscored the need to respond to previous experiences with research. Some teachers had previously participated in a study and were not always positive about the impact on their own practice. The focus was on a reactive strategy that would show the importance of research this time. At the end of the projects labelled as track A, school leaders acted more proactive, including research in school's strategic planning and decided on facilitating teacher researchers with time and space for the year after the project. They made plans for applying for new funding for research and explained the importance of continuing practice-based research in schools for integrating a reflective attitude among teachers. One of the project managers explained:

*Practice-based research is now included in the school-wide training plan. The teacher research group will play a role in this as informers or as supervisors. Also, a framework or research themes is created in our school, and the research teachers ensure that we rise good research questions. (Project C, middle manager)*

The patterns in our analyses indicated such organizational capacity building to occur concomitant with the lessons that the school leaders learned about the school benefits of practice-based research and inquiry-based working. School leaders themselves did not express awareness of this conjunction, however.

## 6.5 | Organising for collective learning by building on results of external researchers

The strategic approach B, hereafter referred to as "track B" was represented by school leaders in eight projects. School leaders in projects E, K, L, M, N, P, Q and R decided to engage external research experts. From the start,

the emphasis in these projects was on increasing interpersonal capacity of teacher teams (subject teams or departmental teams) as a building block for the school as a professional learning community relying on transfer into increased reflective attitude at a personal level. The learning process in this strategy was constructed in a manner that was opposite to that of track A. The collective learning of teachers was organised in connection with research that they did not conduct themselves. With school-specific research results in hand, school leaders hoped to create discussion about what the results meant for teaching practices at the school. School leader contributions consisted primarily of organising meetings at school with external researchers presenting results, followed by joint discussion. The meetings ensured knowledge sharing between researchers, teachers and school leaders. One of the leaders explained why she thought this was important:

*I think the discussing is more important for teachers than analysing research data themselves. The fact that they can design something under supervision and professional consideration is given to this design and the approach of a problem in practice, then that is the result that teachers can work with. I think that performing the research itself is not the goal for teachers. But what are the benefits of the research and how can it help me to teach in a more effective and varied way? That is a question at the core of the teaching job. (Project K, middle manager)*

School leaders in track B recognized four out of five potential benefits of inquiry-based working, usefulness for internal and external accountability excluded. This is consistent with their focus on the collective learning of the teachers in relation to educational improvements. School leaders in Projects N, P, and Q supported the development of inquiry-based practices among teachers in this way; by engaging teachers in education improvements with the support of research based knowledge provided by external researchers. A middle manager 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)*

A thorough and reflective discussion of findings was conducted in projects E, K, L, M and R; this resulted in new knowledge and products for school-specific problems and situations. The school principal in Project L took put the project themes on the agenda of teacher meetings to encourage his teachers to reflect on what their students learn in their classroom as a result of this project. The school principal had the idea that research was needed in school to measure the progress of students, to know what to emphasize and to continue improving his school:

*I have noticed in the last two, three years, that we are increasingly expected 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)*

In these five projects, school leaders expressed that collective learning evolved not just into an increase in manifestations of inquiry-based attitudes in team meetings but also transferred to individual teacher attitudes. The school principal in Project M said "What works is to keep it close to their practice and small". To enhance exam results, she organised training and peer feedback opportunities on how to give feedback to students, after which the teachers experimented with this in their classes. The external researchers evaluated these experiments and shared their

conclusions with the teachers. An outcome of the meeting between external experts and a number of the teachers was the development of new recommendations for all colleagues. The school principal explained:

*That is the heart of the whole story. Children learn by themselves somehow anyway, but the learning of the teacher is the key point. A teacher who learns comes closer to the learning of the children. (Project M, school principal)*

## 6.6 | Increasing organisational capacity

The school leader efforts helped to connect practice-based research, teacher learning and school development for improving education practices during the projects in Track B. School leaders in this track particularly became more familiar with the benefits of practice-based research in the school during the second half of the project. They started to articulate this more clearly as part of their visions of quality in education and school improvement. A school principal stated:

*We are continuing a number of issues that we have deployed, and it has become easier to connect research with that than before. Teachers are now used to learn from each other and to exchange knowledge. This way you see that school development is one of the positive aspects of such a project. (Project I, school principal)*

Similarly as in track A, school leaders in track B did not express awareness of the fact that their own learning contributed to the positive developments during the projects.

## 6.7 | No contribution of projects to the professional learning community

In three projects, there was no strategy for embedding practice-based research and there was a mismatch between the practice-based research and school development. In project O, emphasis remained largely on subject innovation. The school leader saw no reason to link the research topic to the development of the school as a whole. In projects F and G, the school leaders had concerns about the research results. In Project F, the project manager was performing the research, but due to time constraints the research did not advance sufficiently. The school principal in Project G was fairly disappointed, as the research did not match her expectations: teachers did not get a chance to reflect on research results concerning their own students because the results became available the next school year (the teachers had other students). Although the original project plans aimed otherwise, the research carried out in these projects did not contribute to collaborative learning nor to personal capacity development at the teacher level and was not of value for the school's development, according to the school leaders.

## 7 | CONCLUSION AND DISCUSSION

This study explored perspectives of school leaders on the development of inquiry-based practices in Dutch secondary schools in the context of research and development projects that received funding. The research question was: *to what extent and how do school leaders use the opportunity to participate in research and development projects for encouraging and integrating inquiry-based practices in schools?* Twenty-eight persons holding leadership roles were interviewed retrospectively. Within- and cross-analyses of interviews were carried out for examining differences in the integration of inquiry-based practices in schools. In this study, schools were understood

as professional learning communities. We distinguished between school leaders' strategies for capacity building on personal, interpersonal and organisational levels. The research and development projects initiated the use of inquiry-based practices in schools; the majority of leaders perceived the project as a benefit for the school as an organisation. The benefit was categorised as professional capacity building, either already ongoing or emerging throughout the project.

Interestingly, school leaders differed in their strategies for achieving school level project significance. In our analysis we distinguished between two strategic approaches:

1. *Organised and organising learning in school via teacher research* (track A); in some cases from the start of the project (A1-organised); whilst in other cases driven by opportunities that were discovered after the project had started (A2-organising).
2. *Organising for collective learning, building on results of external researchers* (track B).

A more inquisitive attitude developed among teachers involved in the project—in part even on a school-wide level—according to school leaders in both tracks. Participation in teacher research, and the development of skills in research, promoted this in track A. Expertise provided by external researchers—appointed by the school leaders—supported this development in track B. This demonstrates two different approaches for increasing inquiry-based practices. According to the school leaders, both approaches contributed to the development of the school as a professional learning community; an education community in which the (joint) learning of teachers is part of their education practices. The two strategies were characterised by a different course. Track A started with small groups of individual learners and was followed by the formation of a larger group of learners. Track B started with a large group of learners and was followed up with individual actions and learning. School leaders in track A started with *personal capacity building*; namely the individual acquisition of knowledge and research skills by teachers involved in the project, and the development of *interpersonal capacity* through presentations of the research for colleagues. School leaders in track B focused directly on *interpersonal capacity building*, with the purpose of inspiring teachers to improve their practices together. Processing the research and development projects contributed to *organisational capacity building* as well. In track A, project funding was a school resource that contributed to continued school development planning for inquiry-based practices. In track B, the organisational capacity of schools was strengthened by the new insights of school leadership; specifically, the valuation of inquiry-based practices.

Generally, leaders in this study considered practice-based research not as a purpose but as a means for reflective and collective teacher learning and informed decision-making in the school. However, the stage of integrating inquiry-based practices in schools differed: embedding or already embedded. The school leaders of schools in which inquiry-based practices were *already embedded*, made use of available routines for integrate inquiry-based practices and outcomes. They were consciously aware that leadership needed to do so with regard to both school structure and culture. The school leaders who were *embedding* research in their schools started to undertake similar actions two or three years into the project. The process of embedding inquiry-based practices differed for the strategic tracks. School leaders in track A2 started, in the final year of the project, to see the potential of teacher researchers as models and inspiration for other teachers. Leaders in track B recognised, from the start, the opportunity for sharing research results among teachers in schools.

We found that leadership in group A2 tried to integrate inquiry habits in school structure and culture in the final year of the research and development project. The A2 strategy entailed an initial focus on building personal capacity followed by an effort to implement inquiry-based practices in the wider team. However, in contrast to the strategies chosen by groups A1 and B, there was too little time within the framework of the project for integrating practices in school structures and culture using the A2 approach.

A number of school leaders in this study were from the start of the research and development projects consciously and actively involved with capacity building for inquiry-based practices. Almost two thirds of the school

leaders developed an interest in inquiry-based practices during the project; so, actually, the leadership learning was part of the increase of the school's organisational capacity. The school leaders themselves nevertheless seemed unaware that their own increased dedication and learning was also part of the course of developments.

Limitations to this study include the fact that our data consisted largely of retrospective self-reports from school leaders. Moreover, our 'school leaders' were in fact different kinds of managers with varying responsibilities. Our study nevertheless shows that school principals, middle managers and even office administrators were actively involved in encouraging and integrating inquiry-based practices in schools. Similarly as the work of Levin and Datnow (2012), our findings confirm the potential of leadership distribution in creating conditions for, and embedding inquiry-based practices (Anderson et al., 2010; Brezicha et al., 2014). Our study highlighted differences in strategies of school leaders coinciding with the level of integration of inquiry-based practices. The school leaders themselves were only partly aware of their strategies during the projects. Our study actually shows that the research and development projects functioned as a learning opportunity for leaders; their insights and strategies developed, learning from observing their teachers and team efforts during the project. This might seem obvious, but it cannot be taken for granted, as was stated in the review of the Dutch educational system by OECD (2016). Many evaluations of professional development initiatives for teachers conclude that conditions within schools impede success and sustainability. The point that leadership needs to provide better support to the learning of teachers is often made. Explicating leadership strategies, as we have done in this study, is needed to gain knowledge about how school leadership actually can offer the right support, taking into account the history and context of the school. This implies the potential of supporting the professional development of school leaders, for instance by peer learning. More experienced school leaders could advise novice school leaders about what actions can be taken to foster the school development towards a research-engaged professional learning community (Godfrey, 2016).

The policies for government funding of practice-based research that were at the outset of our study, included directions for the commitment of school leaders. Our evaluation of the actual commitment of leadership in the practice-based research projects shows that such commitment matters. Whilst much research focuses on improved teaching and student outcomes, we agree with Coburn and Penuel (2016) that there is a need to consider other research and practice informed aspects, such as the commitment and learning of school leaders. Advocating an increase of our European knowledge base on education leadership and management (Hallinger, 2018; Kovačević & Hallinger, 2019), more systematic research is needed on school leadership strategies for embedding inquiry-based practices in schools.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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