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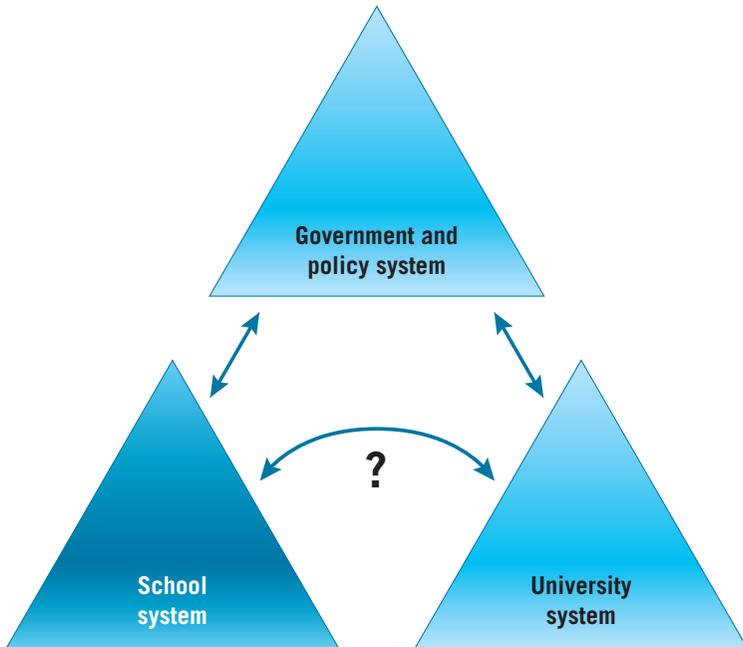
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CHAPTER 3

The impact of teacher research on teacher development and school development in academic development schools in the Netherlands⁵

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As part of a government initiated programme based on the concept of Professional Development Schools, three secondary schools in Amsterdam decided to facilitate teachers in their schools to engage in practice research. This was based on the assumption that research conducted by teachers contributes both to the development of the teacher researcher and to the development of the school as a whole. Based on this assumption, a study was conducted looking at the extent and way in which learning arrangements within an academic development school contribute to teacher development and school development and which aspects of school culture and school organization play a role in this.

In this article, we report on the results of this study. The outcomes show that engagement in research contributed to both individual learning and team learning amongst the teacher researchers. The teacher researchers developed both their knowledge on their research topics and their skills with respect to research. At the same time they developed a greater sensitivity towards the organizational context, the role of the school management and their own role in school development, strengthening their leadership potential. The impact of their research on school development varied, depending on the commitment of the management of the school to give the teacher researchers a key role in initiating change within the school.

⁵ This chapter is based on Snoek, M., & Moens, E. (2011). The impact of teacher research on teacher learning in academic training schools in the Netherlands. *Professional Development in Education*, 37(5), 817-835.

1. Research conducted by teachers

1.1 Four strategies to bridge the gap

For many years, there has been criticism on the gap between educational research and educational practice (Broekkamp & Van Hout-Wolters, 2007; Commissie Nationaal Plan Toekomst Onderwijswetenschappen, 2011; Lagemann, 1997; Lagemann, 2002; Levin, 2004). Many teachers do not believe that educational research is something that can contribute to the quality of their performance (Fleming, 1988; Gore & Gitlin, 2004; National Research Council, 1999).

This perceived gap has resulted in a range of different attempts to bridge or eradicate this gap. Broekkamp and Van Hout-Wolters (2007) draw a distinction between four strategies for bringing research and education closer together. The first of these is the RDD model: Research-development-diffusion (Burkman, 1987; Saettler, 1968). This strategy is based on the assumption that in controlled situations fundamental academic research can result in useful insights on which educational designs and teaching materials can be based. These designs and materials can subsequently be implemented and teachers trained in the use of the new materials. This model has been criticised for being based on deterministic and linear assumptions and - through strictly separated roles between researchers and practitioners - for failing to take account of teachers' concerns (Bulterman-Bos, 2008; Pieters & Jochems, 2003). As a result, this approach risks reducing teachers to mere facilitators of education designed by others.

The second strategy, evidence-based practice, also involves a significant role for fundamental academic research, but in this case the research is conducted in realistic contexts. The assumption is that because of the direct relationship with educational practice, the results of this type of research can be applied by teachers in the classroom. The teachers are expected to use the results of the research as a basis for their classroom performance (Levin & O'Donnell, 1999; Slavin, 2002). In this model, it is important that the academic knowledge is made accessible to teachers, for example by means of 'what works' websites and books. This strategy has been criticised on the basis that evidence-based research in education is not feasible or affordable and is too generalising and also has a delaying and conservative effect (Gravemeijer & Kirschner, 2007). In addition, Biesta argues that research into what is effective is insufficient for teachers who must continually make valued-based decisions and are concerned not only with what works, but also with what is desirable (for individual, unique pupils) (Biesta, 2007; Biesta, 2009).

In the third strategy cited by Broekkamp and Van Hout-Wolters, a key role is played by practices that transcend boundaries. Within such practices, researchers from different disciplines work together with teachers on practice-focused research, innovation and professional development. As a result, the distinctive roles of education and research become more blurred: teachers are involved in research activities and researchers formulate their research questions based on

concerns encountered in practice. This strategy is closely aligned to the model of Professional Development Schools (PDS) which are characterized by partnerships between schools and universities through collaborative research by the partnering institutions (Darling-Hammond, 1994; Holmes Group, 1990).

The fourth strategy is based on knowledge communities: groups of people who share the same passions and interests, benefit from each other's expertise and develop knowledge together. Models along these lines include professional learning communities (Fullan, 2002; Hord, 2004; McLaughlin & Talbert, 2006) and forms of practitioner inquiry, such as action research (Anderson & Herr, 1999; Carr & Kemmis, 1986; Cochran-Smith & Lytle, 2009; Ponte, 2005) and self-study (Loughran, Hamilton, LaBoskey, & Russell, 2004). This model is closely aligned with the Research Engaged Schools as developed by the FLARE project in Essex (Handscomb & MacBeath, 2003).

These last two strategies, involving teachers in schools actively in research activities, have increased significantly in popularity in recent years. In the United States, the concept of 'scholarship' was introduced for teachers in order to stress that education and research should increasingly be combined (Boyer, 1990), in which scholarship stands for teacher work that is informed, intentional, impermanent and inheritable (Coppola, 2007). In the wake of international literature (Cochran-Smith & Lytle, 2009; Loughran et al., 2004), various different Dutch authors have emphasized the importance of teachers' involvement in practice-based research (Bolhuis, 2012; Lunenberg, Ponte, & Van de Ven, 2007; Ponte, 2002; Snoek, 2012; Vrijnsen-De Corte, Den Brok, Kamp, & Bergen, 2009; Vrijnsen-de Corte, 2012). This reflects high expectations with regard to the benefits of teachers' involvement in research, both in terms of the impact on teachers' professional development and the improvement of the quality of everyday classroom performance.

1.2 The impact of research conducted by teachers in schools

Zwart, Van Veen and Meirink (2012) indicate that there is little evidence that involvement of teachers in academic research activities in itself - as an academic activity focused on development of theories - leads to better performing teachers (Grossman, 2005). However, there is evidence that teacher research as inquiry based method for professional development can lead to improved teacher performance and increased learning outcomes of pupils (Van Veen et al., 2010). This impact on teacher performance is supported by experiences from teachers themselves, as reported in the TALIS study, where teachers from 23 countries indicate that they see research as one of the forms of professional development that have the greatest impact (OECD, 2009).

Several studies have been conducted to investigate whether these high expectations are justified. Within the Dutch context, Meijer, Meirink, Lockhorst and Oolbakkink-Marchand (2010) examined the learning results of teachers conducting research in three schools, based on the validity criteria of Anderson

and Herr (1999): outcome validity (quality of the outcomes for the teacher and the school), process validity (the proper use of appropriate research methodologies), democratic validity (the quality of the involvement of different parties in the research: teachers, school students and parents), catalytic validity (the extent to which the research leads to actual changes and transformations in school-based practice) and dialogic validity (the extent to which peer review is used in order to guarantee the quality of the research). The teacher researchers in their study indicated that the main areas in which they have developed are those of conducting research and developing of a more critical attitude with regard to their own actions and the school organization (outcome validity). The study primarily involved fellow teachers and school students (democratic validity). The effect on school-based practice (catalytic validity) remained difficult to measure and mainly took the form of new materials or adaptations at an individual level. The extent to which the results were formally or informally shared within the school (dialogic validity) ultimately depended on the schools' organizational structures. Various authors emphasize the point that research conducted by teachers is inextricably linked with the school organization as a whole and cannot therefore be seen in isolation. Efforts to systematically incorporate these elements within a school places demands on the school culture and the role of the school management in promoting a culture of inquiry (Earl & Katz, 2006; Krüger, 2010; National Council for Accreditation of Teacher Education, 2001; Vrijnsen-de Corte, 2012).

By making a connection between involvement of teachers in research activities and the improvement of the quality of everyday classroom performance, and by emphasizing the catalytic validity and the democratic validity of practitioners research, teacher research is understood as 'a concerted action to bring about change', 'reinventing communities of practice' (Cochran-Smith & Lytle, 2009). This links teacher research closely to conceptions as the 'teacher as change agent' (Fullan, 1993) and 'teacher leadership' as *'the process by which teachers, individually and collectively, influence their colleagues, principals, and other members of school communities to improve teaching and learning practices with the aim of increased student learning and achievement'* (York-Barr & Duke, 2004, pp. 287–288).

1.3 Common characteristics

In research and publications on teacher research, a wide variety of terms is used to describe research conducted by teachers: action research, teacher research, teacher inquiry, practitioner inquiry, self-study, professional learning communities. These concepts share a number of common characteristics (Cochran-Smith & Lytle, 2009):

- The professional context (the classroom, the school) as the place of research
- The teacher as a researcher and a learner
- The practice of working in communities, either by means of professional learning communities (Eraut, 1994; Hord, 1997; Wenger, 1998), or through involvement of 'critical friends' (Ponté, 2005; Wenger, 1998)

- The absence of clearly-defined boundaries between research and practice: The primary purpose of teacher research is to improve practice rather than to develop a theory that is generally applicable
- New interpretations of validity and generalizability
- The role of data collection
- The practice of sharing knowledge

Because opinions on research by teachers vary within academic development schools and cannot be directly linked to a specific concept, in this chapter we use the term generic term 'research by teachers'.

2. The Dutch context

2.1 Academic development schools in the Netherlands

In 2006, the Dutch Ministry of Education, Culture & Science (OCW) invited schools in primary and secondary education to apply for participation in a pilot programme as a 'teacher development school' (*opleidingsschool*) or as an 'academic development school' (*academische opleidingsschool*). Teacher development schools are schools which cooperate closely with teacher education institutes and which are strongly involved in the education of student teachers. A considerable part of the curriculum of initial teacher education takes place within the teacher development schools, involving both teacher educators from the university and mentors in the school. The academic development schools involved an expansion of the concept of 'teacher development school' since it explicitly adds a research component. This academic development school was defined as '*a school that combines its teacher education function with a component consisting of highly practice-oriented research and innovation*' (Ministerie van OCW, 2005c). Based on this definition, the academic development school has much in common with the concept of the Professional Development School (Darling-Hammond, 1994; Holmes Group, 1990) and the Research Engaged School (Handscomb & MacBeath, 2003; Sharp, Eames, Sanders, & Tomlinson, 2005).

From the applications received, eight pilot programmes were selected within primary education and eight within secondary education. The programmes were allocated funding for a three-year period and an extension was granted after 2008. When the pilots were first launched, no concrete guidelines were given on how the concept of the academic development school should be put into practice, which meant that the schools were free to flesh this out for themselves. Since research was a new activity for most schools, schools needed to provide answers to such questions as:

- What is the purpose of the research to be conducted in the school?
- Who will conduct the research in the school?
- What is the relationship between initial teacher education, research, innovation and post-initial professional development?
- What will be the consequences for the culture and structure of the school and for the qualities that teachers require?

In developing the concept of the 'academic development school', the focus in the Netherlands has primarily been on 'knowledge communities' and 'practices that transcend knowledge barriers' as identified by Broekkamp and Van Hout-Wolters (2007). The academic development school always involves a partnership between one or more schools and one or more teacher education institutes. Research is conducted by experienced researchers, students, teachers within the school or a combination of these.

2.2 Stimulating teachers' involvement in research

The active involvement of teachers in the research conducted within schools fits in a wider movement to strengthen the research involvement of teachers in the Netherlands, as can be recognized in attempts to strengthen the research tracks within Bachelor's programmes in teacher education, in the number of workshops and presentations relating to research by teachers and prospective teachers held at national educational conferences, in the increasing number of Master's programmes for teachers in the Netherlands and in the numerous Dutch-language books on school-based research published in the last years (Gerritsma, De Haan, Den Hollander, Mitzschke, & Van der Veen, 2010; Harinck & Vos, 2010; Kallenberg, Koster, Onstenk, & Scheepsma, 2007; Ponte, 2012; Van der Donk & Van Lanen, 2012). This raises the question of how realistic the aim it is to extend the professional identity of the teacher to include the concept of 'the teacher as researcher'. At the same time, it raises the question whether the experiences acquired in the academic development schools with regard to research conducted by teachers have actually strengthened practical knowledge within schools and contributed to professional development of teachers.

2.3 The Academic Development School Amsterdam AcOA

The *Academische Opleidingschool Amsterdam* (AcOA) was one of the pilot programmes. AcOA consisted of three secondary schools in the city of Amsterdam: *Open Schoolgemeenschap Bijlmer* (OSB) and two schools of the *Montessori Scholengroep Amsterdam* MSA (with participation by *Montessori College Oost* MCO and *Montessori Lyceum Amsterdam* MLA). One of the key underlying visions of AcOA was the notion '*that everyone in our organizations who learns – whether they be pupils, trainee teachers, experienced teachers engaged in professional development or even head teachers – learns through professional development, through school development and by conducting research.*' (MSA/OSB, 2005, p. 5). The project's overall objective was: '*The creation of a long-term culture of professional development, school development and research in the schools. We aim to improve the teaching offered to pupils and the development of student teachers in our schools by combining innovation in teaching and school development with research.*' (MSA/OSB, 2005, p. 5). In order to achieve this, each of the schools allocated a group of teachers approximately one day a week for conducting research on research questions of practical relevance for the school. The research subjects were linked to central themes decided at school level. This approach reflected

the fourth strategy of knowledge communities, as highlighted by Broekkamp & Van Hout-Wolters.

In most cases, the teacher researchers worked in teams and were assisted by experienced researchers. In two of the schools, a distinction was drawn between teacher researchers and teacher developers. The role of the teachers developers was to use the outcomes of the research to develop concrete approaches to be used in the classroom. The overall aim of the pilot programme was to connect the three elements of teaching, development and research and to embed them in the schools' practice in such a way as to increase capacity for innovation. It was assumed that – by connecting the processes of teaching, innovation in teaching and school development with research – the quality of learning of the pupils and the professional development of teachers and prospective teachers would be enhanced. The idea was that the research conducted by the teachers within the school would contribute to the creation of a professional learning community. In this way, research was viewed as a driver for professional development and development of teaching or, in other words, as a driver for individual, collective and organizational learning and development. To investigate the extent in which teacher research in this academic development school indeed contributed to individual and team learning and to school development, a research study was designed looking at the actual impact of the teachers' research activities and outcomes and at the factors encouraging or inhibiting this.

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3. Research design

The study focused on the following research question:

To what extent and in what way does research by teachers, as a learning arrangement for teachers within an academic development school, contribute to teacher development and school development, and which aspects of school culture and school organization play a role in this?

Within the research design, we defined school development by the metaphor of collective learning, both on the level of organizational development by the school as a whole, but also on the level of collective learning by the team of teacher researchers (Teurlings, Vermeulen, & de Vries, 2004). According to Senge (1990) team learning is of essential importance because '*teams, not individuals, are the fundamental learning units in modern organizations*' (p. 10). It is within groups that changes take shape. Only when teams are able to learn, the organization can develop. In terms of operational implementation, a decision was made to focus on the teacher researchers. This was motivated by the fact that for the schools involved, research is a new element in their development from teacher development school to academic development schools. The teacher researchers were the pioneers who were given the task of shaping this new element.

Given these new grounds both for schools and teacher researchers, we chose a qualitative explorative research design to identify concerns, issues and negotiating factors which, according to the teacher researchers, play a key role in introducing a research role for teachers in schools. By using interviews focusing on stories and narratives, the study tries to gain insight in underlying processes. Choosing a qualitative study had the additional advantage of allowing the teacher researchers' own voices to be heard. This is in line with the need in the Netherlands to provide teachers with a more explicit and central role in educational innovation (Commissie Parlementair Onderzoek Onderwijsvernieuwingen, 2008; Onderwijsraad, 2007; Rinnooy Kan, 2007).

The research question was divided into four sub-questions.

1. What do the teacher researchers learn from conducting research?
2. What and how do they learn as a team?
3. What contribution do they make in their own view to development of the school as a whole?
4. What factors in the organizational and cultural conditions of the school support or inhibit these processes of individual learning, collective learning and school development?

At the level of the individual, learning can be translated into increased competence of the teacher researcher, which can be manifested at a number of different levels: that of knowledge, skills, attitudes, involvement and identity. Moreover, individual learning can focus on coming to grips with the role of teacher researcher and the process of research or on the subject of the research itself. With regard to team learning, the focus was on examining the extent to which there was a feeling within the team of teacher researchers that participants had developed shared knowledge and understanding. With regard to organizational development, the primary focus was on the interaction and exchanges between teacher researchers and school management, teams within the school (subsidiary school teams or sections), student teachers and teacher education institutes. In addition, attention was paid to positive and inhibitive factors in the structure and culture of the schools.

Answers to these questions were provided by means of a qualitative study of the teacher researchers' perceptions based on semi-structured interviews with eleven teacher researchers and conducted in groups in each school, supplemented by other sources: content analyses of key documents, participatory observation and reports on consultations with teacher researchers. The decision to opt for a qualitative study into the teacher researchers' perceptions created a restriction as there was no formal measurement of the actual learning benefits and no account taken of the perceptions of other stakeholders such as the school management. On the other hand this qualitative and narrative focus did make it possible to assess the outcomes experienced by the teachers, ensuring that the views of the teacher researchers played a central role. In this way two-third of the teacher researchers that were

involved in the pilot programme were interviewed. The interviews with the teacher researchers were transcribed and labelled on the basis of the research questions. The study covered the period September 2006 – April 2008.

4. General outcomes

In this section, we outline the global results. In this, no distinction is drawn between the different schools. The conclusions are illustrated by typical quotations from the interviews.

4.1 Individual learning

In the questions posed to the teacher researchers, a distinction is drawn between what they have learned from **doing** research and what they have learned from the **content** of the research itself. With regard to the first question, none of the teacher researchers had experience with educational research at the outset. Most of the teacher researchers who had conducted some research as part of their studies had largely forgotten any research skills they might have acquired. As a result, the teacher researchers indicated that they had learned a lot from conducting research. They referred not just to knowledge and skills relating to research methodologies, but also to changes in attitude, involvement and identity.

You learn that your own behaviour is not self-evident, but rather something you can question.

My attitude has changed and I have a much firmer basis for what I do. In the classroom I am more aware of the different variables at play, I reflect on these more and have adopted a more investigative approach to my class, for example with regard to the variable of disruption.

For me, it was a real eye-opener to realise how closely connected research is to classroom practice, and I gradually noticed this more and more. You can take a question, wondering how it will work in practice, and then study it. It helps you focus on your everyday practice – you need to be prepared to really question yourself to see whether what you're doing is effective.

Research enhances the work you do, shows that it matters what you do and that you can improve the quality.

What I really enjoy is looking at things from a slight distance. As a teacher, you focus on the lessons. As a researcher, you look at things from the outside and can ask questions. People use me as a source of information and I enjoy that detachment.

It actually gives me a lot of pleasure. I simply enjoy dealing with people and finding out how people experience things; this is something I liked doing anyway. And the feeling that you can contribute something that will be

beneficial to the school, and that I feel as if I'm doing something that will have a lasting effect... that I have done my bit to create something for the future that may even last... that it is something I can be a little proud of.

I have learned a lot about the research process itself. In the past, I would notice something in the lesson that I wanted to change and then come up with something new. Now I start by thinking about why you do something and the reasoning behind it, what research it is based on, whether you just improvise or genuinely try to change something. That awareness is something completely new for me.

Another part of the learning outcomes relate to the content of the specific research theme on which the teacher researchers focused themselves. Various teacher researchers indicated that their research gave them the feeling that they had achieved a certain level of expertise with regard to the research theme and a new understanding of their pupils and/or lessons. For example, they had seen new ways of teaching used by colleagues or they had learned more about rules concerning lesson design. Several teachers also provided examples of what had changed in their behaviour:

You discover that you have become something of an expert in the area...

I now focus on different things in the classroom, and I am much more conscious when applying principles. Telling the children in advance what they will be learning. Evaluating things afterwards. Offering as many different working methods as possible. I teach English, which a lot of the children quite like anyway. But I have become much more aware of what I'm doing. Also, I see other colleagues teaching and think 'those learning activities look great too'.

Preparing and evaluating this type of themed lesson really helps me understand the standards it needs to meet.

Talking to the pupils and listening to their ideas about the mentoring scheme helps you to see the bigger picture from their perspective, it helps you improve your capacity for seeing things from a different perspective.

Finally, a number of teacher researchers said that conducting research had also had an impact on the way they view the school organization and their role within it.

Maybe I have also learned to be clearer in my approach to the school management when I want to get something done. It's because I feel more self-assured and really feel I have developed. Not just presenting a problem and expecting it to be solved. But actually thinking about problems and thinking about what I want. And proposing solutions.

What stands out is that teachers primarily highlighted generic learning outcomes. The teacher researchers said that they:

- had gained a more realistic impression of and more understanding for fellow teachers, school management and themselves, through a deeper knowledge and understanding of the school as a whole and of the role played by management;
- learned to work with others in a different way and to make use of the various skills within the team;
- gained an interest in research because they had begun to understand its practical usefulness, e.g. in enabling them to raise and discuss issues;
- realised that many themes are much more complex than they had first thought;
- learned to approach things with a greater professional detachment and to see them from different perspectives.

4.2 Team learning

In two of the three schools, the teacher researchers indicate that a real process of team formation had taken place: Teacher researchers supported each other and contributed ideas on each other's research subjects.

We form a close team in which we complement each other. Recently someone dropped out and we quickly noticed how we missed that person's specific knowledge and input as a result. We give each other feedback and act as a sounding board for each other when we're not sure how to proceed. It takes time to gain confidence in each other in order to agree on a plan. Things went from good to even better and there is a real sense of connection now.

We are certainly a team. Our different personalities have really come to the forefront, which is great to see, and is extremely useful when sharing our tasks. For example, one person might be really effective at arranging things quickly. Another might excel at writing and looking at things analytically. It's a really good combination. I feel as though we complement each other.

Yes, I would certainly call it a team, because I get a lot of support from them... They are a group that I can turn to. I depend on them.

Yes it is certainly a team, to the extent that, I was really struggling just now, and you walk into the corridor and see X standing there and Y walking past and there's a look of recognition. The feeling of, hey, we belong to the same team: that type of feeling.

Based on the responses of the teacher researchers, this process of team formation led to several effects:

- the group developed a shared knowledge and understanding about research and the school
- the group developed a shared sense of purpose because its members are all enthusiastic about changing things in the school
- the team members considered themselves part of the team

- the teacher researchers provided mutual support and acted as a sounding board for each other
- the team members gained confidence in each other and developed bonds of friendship.

The fact that the school management of one school also approached the teacher researchers as a group to contribute ideas about innovation and internal teacher development, helped to strengthen the process of team formation. The interviews showed that team learning was considered most successful if a small group of teachers can work on the same research project, with each of them devoting approximately the same number of hours and without a distinction being drawn between teacher researchers and teachers responsible for design tasks.

If the research and design components were separated here as they are in other schools, I would stop doing it... It would be like a child with two mothers... one who looks after it and the other who raises it... the two are too closely related and 80% of the time would be wasted.

I am glad that at our school design and research are done by one and the same person, because one leads on naturally from the other.

I'd like to work with a group on the same research project. By working together, we can share the benefits, keep each other on our toes, complement each other and take advantage of each other's strengths. I also feel that by working together we achieve much more.

In two schools, a distinction was made between designers (who were given only a limited number of hours) and the researchers (who were given many more hours), but this did not lead to productive cooperation. At the outset, the teacher researchers had to formulate their research question, which meant that the teacher designers could not be deployed until a later stage. The same applies to the involvement of student teachers.

It definitely takes a while for things to become clear and it was actually only in the last year that the penny really dropped. This is because you gain a greater understanding of conducting research and of what is going on in the school in the process. It is only when you fully understand this yourself, that you can communicate it to student teachers and involve the student teachers in something that is useful to the school.

In addition, the fact that the teacher researchers had to provide direction to a group of teacher developers did not always fit well within the informal culture that exists among colleagues at many schools.

The task description of the development team laid a certain level of emphasis on the fact that the teacher researcher was in charge of the design team. At the start, I was not even sure what it all involved but I still had to provide direction to a team. At times I had no idea myself, so how could I provide leadership to others? I found it really difficult.

I think that it might have been this informal character that caused the design team to break up. It may also have been because at that point I was not really ready or capable of taking on a leadership role. It all remained quite informal. There wasn't really any set procedure for meetings.

4.3 Contribution to organizational development within the school

The teacher researchers' views on the contribution made by their research to organizational development vary significantly among the schools. In only one of the schools the teacher researchers are positive about their research's contribution to wider school development.

The school development days are now much more active. A real exchange of ideas takes place now, something which has gradually grown. These days have helped to make clear to the rest of the school what the innovation team is doing and the general response has been positive. Some people also contribute suggestions themselves.

There is now more discussion about teaching. In the past, we had study days. These involved a speaker and were sometimes interesting, sometimes less so. And after the study days it was business as usual. Now, it feels like each new study day is related to the previous one. There is actually a sense of development, which people appreciate. They enjoy taking part and attendance has improved. There is clearly more involvement than there used to be.

In achieving this learning effect, it was important that key figures in the school (school management and team leaders) adopted the research projects and involved teacher researchers in processes of school innovation. It sometimes proved difficult to achieve a connection with other teams within the school. In only one of the schools the role of the teacher researchers was positioned in a truly effective way: the school management made them responsible for coordinating eight internal development days. During these days, the teachers responsible for research and innovation were able to share their knowledge and gain feedback from colleagues. This proved to be effective: everyone within the school was aware of what the teacher researchers were doing and the teacher researchers felt that gradually people were starting to discuss classroom innovation more intensively within the school. At the other schools, the teacher researchers felt that their channels of communication with the school as a whole were limited and that they had too few possibilities to communicate the relevance of their research for classroom innovation widely.

The interviews revealed that for organizational development to happen, there needed to be close interaction between the school management and the teacher researchers. In the course of the project there was evidence in all three schools that both teacher researchers and school management struggled to identify their own role and to define their power and responsibilities.

I actually invested an awful lot of time in the whole process of change within

the school and I was very uncertain about the whole thing. I was unsure of what position I really had in the school. I really found it quite difficult.

When the management of the school structured the research activities too rigid, it became difficult for the teacher researchers to develop a sense of ownership of their research or design. On the other hand, too much freedom hindered the teachers in carrying out their task and disseminating the results to the rest of the organization because of the lack of a clear structure and framework for the research. According to the teacher researchers, the most effective structure was a situation in which school management devised a clear plan and framework in advance and ensured that a number of themes are formulated but subsequently showed a willingness to step back in order to enable teachers to develop a sense of ownership of their research/design and formulate their own questions. This created space for the teacher researchers and prevented them from feeling isolated within the school.

We gradually began to discover our own role and take control of things. We make recommendations which are taken seriously by the school management. The school management also needed to get used to this kind of process. Our role is now much clearer and I'm happy about that. Everyone is now aware of their own responsibility.

Various teacher researchers indicated that they would like to make a contribution to school development rather than focusing their research on an individual interest of their own. In order to ensure that the research theme is effectively linked to school development, it was important for the school to have a clear vision that provides direction in the choice of research ultimately conducted.

5. Discussion

5.1 The contribution of teacher research to professional development and school development

In the context of the *Academische Opleidingsschool Amsterdam*, the teacher researchers believed their involvement in conducting research actually led to increased professional development at a range of levels. One thing that stands out is that learning was achieved not only in relation to the specific theme of their research studies, but also with regard to professional detachment, awareness of the school's overall vision and the school organization, insights into conducting research, the understanding of colleagues, and awareness of one's own passions and potential. In this respect, the research at the *Academische Opleidingsschool Amsterdam* led to a more professional attitude on the part of teachers and helped counteract a sense of 'us and them' within schools. The fact that various teacher researchers were working in the schools also led to processes of teambuilding and the development of shared knowledge both in terms of conducting research and of the specific subjects covered by the research. The teacher researchers felt that they had a shared mission and

could act as support and a sounding board for each other. Team formation was reinforced when the school management addressed the teacher researchers as a group and involved them in discussions and decision-making about innovation and education within the school. In those schools, where a distinction was drawn between the teacher researchers and those responsible for classroom innovation under the direction of the teacher researchers, the teacher researchers often felt that this did not fit in with the informal culture within the school and therefore this model proved not to be effective in the two schools in which it was applied. The contribution the teachers' research made to organizational development as a whole varied among the different schools. This appeared to be highly dependent on the extent to which the research subject was being made relevant to the school as a whole. Improvements can be achieved in this area by means of combined action by the school management and teacher researchers in determining the ultimate research question and in disseminating the results of the research at study days within the school.

5.2 Key conditions for successful academic development schools

The interviews revealed a number of key preconditions with regard to the organizational culture and organizational structure within the school that the teacher researchers believed were necessary in order for an academic development school to be successful.

The importance of ownership and involvement

As highlighted above, a balance needs to be struck in terms of the space and direction provided with regard to the content of the research. The school management and teacher researchers must be able to feel that they both have ownership of the research themes. The shared intention is that the research contributes to school development. This calls for the school management to formulate and monitor the frameworks and structural links within the school by means of the following:

1. allocating a position to the researchers and acting as a 'commissioning party';
2. monitoring, supporting and supervising the research as a whole;
3. remaining in dialogue, translating ideas into structure and arriving at decisions if necessary;
4. creating channels of communication within the school as a whole;
5. making use of the results.

This also contributes to the feeling of acknowledgement and pride that teachers can derive from conducting research and to the permanent embedding of educational development within the school as a whole.

The importance of teamwork

All the teacher researchers in this study indicate that motivation and inspiration are highest when they are working with other people, preferably on the same research theme. They indicate that learning is more effective if it occurs in a

group in which teachers develop things together, can take advantage of each other's skills and feel that they really need each other.

Room for variety

There are many differences in school culture, personal preferences, and the phases of development in the schools, but also in type of research questions. This means that there needs to be room for variety in research design and structure. It is important to avoid a rigid structure and to carefully consider what suits the particular school at that time.

Focus on research, design and implementation

In the schools studied, combining the research and design roles in a single task and in an individual teacher researcher, proved to be the most effective method. The teachers who carried out these two tasks together considered them as two facets in the innovation process. However, for the dissemination and implementation of research results, it can be useful for teacher researchers to work together with a group of teachers and students who they involve in the formulation of the research question and in conducting the research, and who attempt to implement the results of the research in their teaching. This enables a research strategy which corresponds to the second strategy highlighted by Broekkamp & Van Hout-Wolters. It can generate a snowball effect in the implementation of the research results since colleagues (and prospective colleagues) can benefit from the competence developed by the teacher researcher. Timing is an important aspect in all this. This proved to be a problem in the schools that drew a distinction between teacher researchers and teachers-as-innovators.

Impact on the school culture

The case studies showed the importance of connecting with the prevailing school culture when designing the structure of an academic development school. For example, an informal culture is not conducive to a structure in which teacher researchers must supervise their fellow teachers. On the other hand, research within the school can also play a role in changing the culture. Several teachers indicated in the study that the research had reinvigorated discussions on teaching and learning within the school. All the schools highlighted that conducting research in the school provides a counterbalance to the dominant culture of ad hoc action and of 'doing' in which little time is taken to reflect.

Bringing teacher researchers into position

One thing that emerged in this study was that, in order to achieve a connection with the whole school, it is important to give teacher researchers a position in the school. The school management plays a crucial role in this. The experiences of the teacher researchers in this case study show that it is important to consider in advance what possibilities there are for communicating with the whole school about what is being achieved within the framework of the academic development school.

Room for a new dynamic

Conducting research and teaching pupils call for a completely different dynamics. This means that creating an academic development school demands self-discipline within the school at a range of levels. Research involves a different dynamic from the dynamics of teaching and educational innovation. School management must not expect to see concrete and usable results too quickly. Research calls for a long-term approach and can be at odds with more ad hoc forms of organization at schools. Especially in cases where the teacher researchers still need to develop their own competencies in terms of conducting research, the process of formulating effective research questions and research designs can be time-consuming. If no account is taken of this different dynamic, research is likely to remain a kind of 'foreign body' within the bustle of school life, which can easily produce feelings of irritation.

Room for concentration

In general, the teacher researchers felt that the time allocated for research (one day per week) was sufficient, but could be organized more efficiently. They said they would prefer to have one whole day without other duties, rather than the hours being spread across the week. This is because other urgent priorities can easily eat into the research time. The teacher researchers at all the schools also highlighted the benefits of occasionally working one or two days away from the school and the fact that a designated workplace would be more conducive to the concentration, communication and teamwork required.

6. Conclusion

6.1 Limitations of the case study

The study took place within one of the sixteen academic development schools in the Netherlands during the initial phase of the project. This means that its results are limited in scope: it is a snapshot within a specific local context. In addition, the research question was answered from the perspective of the teacher researchers. The research question concerning the contribution of teacher research to individual learning by teacher researchers, to team learning and to organizational development was not answered by means of a measurement of the absolute increase in knowledge or concrete improvements at these three levels, but by asking the key individuals responsible for shaping a new process within the school about their perceptions with regard to the outcomes and problems experienced.

The actual research projects conducted within the academic development school were not a subject of this study. This means that we are not in a position to make any assessment of the process validity of the research conducted in the schools. In view of the duration of the study, it was also not possible to make any assessment of the impact of this research on innovation within the schools (catalytic validity).

6.2 Four types of outcomes

With regard to the outcome validity of the research conducted within the schools, the interviews with the teacher researchers showed that the academic development school can result in four different types of outcomes:

1. Learning outcomes that are based on concrete research results and which contribute to achieving greater depth, understanding and variation in the knowledge of the teacher researchers and others with regard to the theme of the research. These learning outcomes also contribute to a deeper insight into the effectiveness of new classroom innovations or contribute to the clarification of the school's overall vision. This opens up opportunities for improvement and further classroom innovation and school development.
2. The development of a broader sense of professionalism and leadership among the teacher researchers involved. The teacher researchers interviewed said that they had developed in the following areas:
 - professional detachment and the ability to see things from different perspectives;
 - awareness of the school vision and educational concept;
 - awareness of the school as a complex organization and the role played by management;
 - awareness of the potential added value of research and its benefits for classroom innovation;
 - a more realistic impression and a greater understanding of colleagues and of their own actions;
 - new ways for cooperation and increased awareness of the qualities of colleagues;
 - increased understanding of their own passions, competencies and potential.
3. The development of closely-knit innovation teams in the school, with shared knowledge and involvement in the school and an understanding of the school as a whole. In addition, it also increases awareness of a shared objective, that of working together to improve teaching at the school
4. Bridging the 'us and them' relations between teachers and management in the school. In all of the schools, the teacher researchers said that they now had a greater understanding of and in some cases more trust in school management. In at least one of the cases, this led to a different attitude on the part of teachers towards school management, which enabled both groups to act as equal partners in dialogue with a shared objective and allowed each to take on their own tasks and responsibilities for school development.

The last three outcomes in the list above are probably just as important as the first because openness, understanding and teamwork between teachers and between teachers and school management create the basis for the development of a professional culture and teacher leadership that focuses on improving quality. It is clear that this kind of learning process requires investment. All the teacher researchers were allocated approximately one day in their weekly schedule for conducting research. This shows that research is not something

that the teacher can simply do in his or her spare time. Although this is a significant time investment, it can be compared with a Master's degree programme, which also requires around one day a week and might result in similar learning outcomes.

The comments made by the teacher researchers with regard to team learning provide an indication of the dialogic validity, showing how the teacher researchers support each other as peers. The support offered by research experts from the University of Amsterdam Graduate School of Teaching and Learning also contributed to increasing the dialogic validity. It is not possible to make any pronouncements about the democratic validity of the research conducted in the school because none of the interviews referred to the extent to which the various stakeholders were actively involved in the research.

6.3 Relation with other studies

The results of our study are comparable with the results of other studies. Research by Darling-Hammond shows that research conducted by teachers not only leads to a deeper understanding on the part of teachers of how they can involve pupils in active learning processes but also ensures that they are better equipped to act as teacher leaders and agents of change within schools (Darling-Hammond, 1994). The types of outcome highlighted above (especially the development of a broader professional approach by teachers and the bridging of 'us and them' relationships) correspond with the results of research conducted by Loughran. He points out that practice-oriented research conducted by teachers can lead to a change in perspectives (Loughran, 2002).

The study by Meijer et al. was conducted in a similar context: an academic development school in the Netherlands (Meijer et al., 2010). Because of the pilot character of the academic development schools, the various pilot programmes differ in terms of context and structure. As a result, our study also leads to additional recommendations. In their recommendations, Meijer et al. highlight the importance of teamwork, providing access to research outcomes, a focus on the different forms of validity (Anderson & Herr, 1999), and the need for teachers to reassess their professional identity and begin to consider themselves more as producers of knowledge. Our research also shows the importance of teamwork and the need for equality within this process. Following on from Meijer et al, the teacher researchers in our study stress the importance of the culture and structure within the school for optimising the learning impact of the research conducted by teachers at the school level. Commitment on the part of school management is essential in this. Teacher researchers are not content to pursue their own individual preferences; what they want is to contribute to school development. In order to achieve this, teacher researchers need to be given a clear position and status within the school. The school management can also help to ensure that the results of the research projects are actually used within the school by giving the teacher researchers a leading role in team meetings and study days. This can help intensify the link between

professional development, educational innovation and school development achieved by means of research.

On the provision that these preconditions are met as much as possible, virtually all the teacher researchers believed the academic development school to be an effective structure, as the following statement by one of them shows:

I think it is a highly effective way of enabling things to develop from the inside-out. Of course, that is not the whole picture, as there is also some direction from above. But in my experience, when things are imposed on teachers they are not very effective. This is a nice combined approach which I believe shows great promise for the years to come.