Looking at things from a slight distance: Learning outcomes from research conducted by teachers

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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 learning of the teacher researcher and to the learning and development of the school as a whole. Based on this assumption, a parallel study was conducted into the actual contribution made by the teachers' research to individual and collective learning within the school.

In this article, we report on the results of this study. After a brief outline of the background to academic training schools in the Netherlands and the objective of the Amsterdam Academic Training School (Academische Opleidingsschool Amsterdam), we will describe the research design, which involved a perception study among the teacher researchers concerned (Moens 2008) with a focus on individual learning, team learning and organisational learning. The conclusion and subsequent evaluation summarise the results and lessons to be learned in order to stimulate and guarantee a research culture within schools.

Keywords: teacher research, teacher learning, collective learning, professional development schools

Research conducted by teachers

In the debate about the quality of education and the professional development of teachers, there have been regular calls in recent years for the strengthening of educational research. For many years, there has also been criticism on the gap between educational research and educational practice (Lagemann 1997, 2000; Levin 2004; Broekkamp & Van Hout-Wolters 2007). Many teachers do not believe that educational research is something that can contribute to the quality of their performance (Fleming 1988; National Research Council 1999; Gore & Gitlin 2004).

This perceived gap has resulted in a range of different attempts to bridge or eradicate it. Broekkamp & Van Hout-Wolters (2006) draw a distinction between four strategies for bringing research and education closer together. The first of these is the RDD model: Research-development-diffusion (Saettler 1968; Burkman 1987). This strategy is based on the assumption that in controlled situations fundamental academic research can result in useful insights and adaptations suitable for educational designs and teaching materials. These can subsequently be implemented and teachers trained in the use of the new materials. This model has been criticised for being based on deterministic assumptions and failing to take account of teachers' concerns. 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 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'Donell 1999, Slavin 2002). In this model, it is important that the academic knowledge be 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 (2007, 2009) also argues that research into what is effective is still insufficient for teachers who must still continually make valued-based decisions and are concerned not only with what works, but also with what is desirable (for individual, unique pupils). In the third strategy cited by Broekkamp & Van Hout-Wolters, practices that transcend boundaries play a key role. Within these 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 vague: 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 PDS model. 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 (McLaughlin & Talbert 2002, Fullan 2002, Hord 2004) and forms of practitioner inquiry, such as action research (Carr & Kemmis 1986, Anderson & Herr 1999, Ponte 2005, Cochran-Smith & Lytle 2009,) and self-study (Loughran et al. 2004).

These last two strategies have increased significantly in popularity in recent years. This is closely linked to views on teachers' extended professionalism:

> The outstanding characteristic of the extended professional is a capacity for autonomous professional self-development through systematic self-study, through the study of the work of other teachers and through the testing of ideas by classroom research procedures. (Stenhouse 1975, p144).

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 (Loughran et al. 2004, Cochran-Smith & Lytle 2009), various different Dutch authors (Ponte 2002, Lunenberg, Ponte & Van der Ven 2007, Vrijnsen-de Corte et al. 2009) have emphasised the importance of teachers' involvement in practice-based research. This means that there are high expectations with regard to the involvement of teachers in research, both in terms of the impact on teachers' professional development and the improvement of the quality of everyday classroom performance. The notion that teachers believe that involvement in research can contribute to their professional development is confirmed in the TALIS study, in which 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 et al. (2010) examined the learning results of teachers conducting research in three schools, based on the validity criteria of Anderson & 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 indicate that the main areas in which they have learned are those of conducting research and developing of a more critical attitude with regard to their own actions and the school organisation (outcome validity). The study primarily involved fellow teachers and school students (democratic validity). The effect on school-based practice (catalytic validity) remains difficult to measure and mainly takes 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 forms of organisation employed within the schools. Various authors emphasise the point that research conducted by teachers is inextricably linked with the school organisation 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 (NCATE 2001, Earl & Katz 2006, Krüger 2010).

In the 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 the organisation of 'critical friends' (Wenger 1998, Ponte 2005)
- The absence of clearly-defined boundaries between research and practice: The primary purpose of improving practice rather than developing 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 training schools and cannot be directly linked to a specific concept, in this article we use the term generic term 'research by teachers'.

Academic training schools in the Netherlands

In 2006, the Ministry of OCW invited schools in primary and secondary education to apply to take part in a pilot programme as a training school or as an academic training school. Training 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 training schools, involving both teacher educators fro the teacher education institute and mentor in the school. The academic training schools involved an expansion of the concept of 'training school' since it explicitly adds a research component. This academic

training school was defined as ‘a school that combines its training function with a component consisting of highly practice-oriented research and innovation’ (Ministry of OCW, 2005). Based on this definition, the academic training school has much in common with the concept of the Professional Development School (Holmes Group 1990; Darling Hammond 2005)

From the applications received, eight pilot programmes were selected for primary education and eight for 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 training 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 training, research, innovation and professional development?
- What will be the consequences for the culture and structure of the school and for the qualities that teachers require?

In the development of the idea of the ‘academic training school’, the focus in the Netherlands has primarily been on the ‘knowledge communities’ and ‘practices that transcend knowledge barriers’ as identified by Broekkamp & Van Hout-Wolters. The academic training school always involves a partnership between one or more schools and one or more teacher training institutes. Research is conducted by experienced researchers, students, teachers within the school or a combination of these. As involvement of teachers in conducting research has been an area of particular focus in recent years in the Netherlands, many academic training schools focus on the active involvement of teachers in the research conducted within schools. This emphasis has also been evident in teacher training and continuing education in the Netherlands as can be seen in the strengthening of research tracks within Bachelor’s programmes in teacher training, 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 three years. On the one hand, 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’ and, on the other hand, whether the experiences acquired in the academic training schools with regard to research conducted by teachers have actually had the effect of strengthening practical knowledge within schools and of contributing to the professionalization of teachers.

One of the pilot programmes was the Academische Opleidingsschool Amsterdam (AcOA), which involved three secondary schools in the city: 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 the AcOA was the notion ‘that everyone in our organisations who learns – whether they be pupils, trainee teachers, experienced teachers engaged in professional development or even head teachers – learns through

education, through development and by conducting research.' The project's overall objective is: 'The creation of a long-term culture of training, development and research in the schools. We aim to improve the teaching offered to pupils and the training of students in our schools by combining innovation in teaching and school development with research.' (MSA/OSB, 2005, p.5). In order to achieve this, in each of the schools, a group of teachers was allocated 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 reflects the fourth strategy highlighted by Broekkamp & Van Hout-Wolters.

In many 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 results 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 to each other and to embed them in the schools' practice in such a way as to increase their capacity for innovation. It was assumed that – by connecting the process of teaching and innovation in teaching and of school development with research – the quality of learning of the pupils and the learning and 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 teaching development or, in other words, as a driver for individual, collective and organisational learning. This led to the design of a parallel study looking at the actual contribution of the teachers' research to individual and collective learning within the school and into the question of which factors encouraged or inhibited this.

Research design

The study focused on the research question '*What does teachers' research contribute to individual and collective learning within the school?*' Within the research design, the collaborative level did not only included organizational learning by the school as a whole, but also collaborative learning on the level of the team of teacher researchers (Teurlings & Vermeulen, 2004). According to Senge (1990) team learning is of essential importance because 'teams, not individuals, are the fundamental learning unit in modern organisations' (p10). It is within groups that changes take shape. Only when teams are able to learn, the organisation can learn. 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 ongoing development as training schools. The teacher researchers were the pioneers who were given the task of shaping this new element. Choosing a perception 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 (Commitee on the Teaching Profession 2007, Dutch Education Council 2007, Parliamentary Committee Educational Innovations 2008).

As a result, the research question was divided into three sub-questions.

- What do the teacher researchers learn from conducting research?

- What and how do they learn as a team?
- What contribution do they make in their own view to learning in the school as a whole?

At the level of the individual, learning can be translated into increased competence on the part of the teacher researcher, which can be seen 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. In the case of 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. For organisational learning, the primary focus was on the interaction between and exchanges with school management, teams within the school (subsidiary school teams or sections), students and training 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 in so far 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, but on the other hand it 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 around three-quarters 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.

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.

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 of 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 research 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 then 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 the reasoning behind it and why you do something, 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. Various teacher researchers indicated that their research had led them to feel 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, because they had seen new ways of teaching taught by colleagues or because 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 organisation and their role within it.

- Maybe I have also learned to be clearer in my approach to 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 because they had greater 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, including for raising issues and enabling them to discuss these;
- realise that many themes are much more complex than they had first thought;
- approach things with a greater professional detachment and are able to see them from a different perspective.

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 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 out 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.

This process of team formation had a number of effects:

- the group has a shared knowledge and understanding about research and the school
- the group has a shared sense of purpose because its members are all enthusiastic about changing things in the school
- team members consider themselves part of the team
- teachers provide mutual support and act 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 group of teacher researchers as a group to contribute ideas about innovation and internal training helped to strengthen the process of team formation. It emerged from the interviews that

team learning is most successful if a small group of teachers work on the same research, with each of them devoting approximately the same number of hours and without a distinction being drawn between the teacher researchers and the 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. 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 decision was made to draw a distinction between designers (who were given only a limited number of hours) and the researchers (who were given many more hours), but this did not led 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 students.

- 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 students and involve the students in something that is useful to the school.

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

- The 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.

Contribution to organisational learning within the school

The teacher researchers' views on the contribution made by the research to organisational learning vary significantly among the schools. In only one of the schools are the teacher researchers positive about their research's contribution to learning in the school as a whole.

- 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 for key figures in the school (school management and team leaders) to adopt the research and involve teacher researchers in processes of school innovation. In the current phase of the project, it sometimes proved difficult to achieve a connection with other teams within the school. In only one of the schools was the role of the teacher researchers positioned in a truly effective way: the school management made them responsible for coordinating eight internal training days. During these days, the teachers responsible for 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 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 ensure that the relevance of their research for classroom innovation was communicated widely.

The interviews reveal that for organisational learning to happen, there needs to be close interaction between the school management and the teacher researchers. In the course of the project there was evidence in all the schools of both teacher researchers and school management struggling to identify their own role and to define their powers 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.

If the management of research activities is too rigid, it becomes difficult for the teacher researchers to develop a sense of ownership of their research or design. On the other hand, too much freedom can hinder the teachers in carrying out their task and disseminating the results to the rest of the organisation because of the lack of a clear structure and framework for the research. The most effective structure would seem to be a situation in which school management devises a clear plan and framework in advance and ensures that a number of themes are formulated but subsequently shows a willingness to step back in order to enable teachers to have ownership of their research/design and formulate their own questions. This creates space for the teacher researchers and prevents 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 is important for the school to have a clear vision that provides direction in the choice of research ultimately conducted.

Conclusion

In the context of the Academische Opleidingsschool Amsterdam, the teacher researchers believe 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 organisation, insights into conducting research, understanding 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 the specific subjects covered by the research. The teacher researchers feel that they have a shared mission and can act as support and a sounding board for each other. Team formation is reinforced if the school management addresses the teacher researchers as a group and involves them in discussions and decision-making about innovation and education within the school. 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 organisational learning as a whole varied among the different schools. This appeared to be highly dependent on the extent to which the research subject is 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.

The interviews revealed a number of key preconditions with regard to the culture and structure within the school that the teacher researchers interviewed believed were necessary in order for an academic training 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 management provided with regard to the content of the research. The school management and teacher researchers must be able to feel that they have ownership of the research themes. The research conducted must contribute 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:
  a. allocating a position to the researchers and acting as a 'commissioning party'
  b. monitoring, supporting and supervising the research as a whole
  c. remaining in dialogue, translating ideas into structure and arriving at decisions if necessary
  d. creating channels of communication with the school as a whole
  e. 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 teachers in this study indicate that motivation and inspiration are at their 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 research questions. This means that there needs to be room for variety in research design and structure. It is important to avoid too rigid a 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 design and research roles in a single task and individual 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 conducting the research, and who attempt to implement the results of the research in their teaching. This enables a model to be developed in the school corresponding 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 training school. For example, an informal culture is not conducive to a structure in which teacher researchers must provide leadership to 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 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 Training School.

- *Room for a new dynamic*
  Conducting research and teaching call for a completely different dynamic. This means that the development of an academic training 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 organisation 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 organised 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.

Discussion

The study took place within one of the sixteen academic training 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 organisational learning was not answered by means of a measurement of the absolute increase in knowledge 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 training school were not a subject of this study. This means that this study is 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).

With regard to the outcome validity of the research conducted within the schools, the interviews with the teacher researchers showed that the academic training 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, provide 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 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 organisation and the role played by management
    - awareness of the potential 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 form the basis for the development of a professional culture 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 results 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. The results of our study are comparable with the results of other studies. Research by Darling-Hammond (2005) 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 agents of change within schools. 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 (2002). He points out that practice-oriented research conducted by teachers can lead to a change in perspectives. The study by Meijer et al (2010) was conducted in a similar context: an academic training school in the Netherlands. Because of the pilot character of the academic training 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 results, 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 teacher researchers stress 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 to 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 ensure that the results of the research 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 believe the academic training 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.

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