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Baan, J.; Gaikhorst, L.; Volman, M.L.L.

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The involvement of academically educated Dutch teachers in inquiry-based working

Jan Baan , Lisa Gaikhorst  and Monique L.L. Volman 

Research institute of Child Development and Education, Universiteit van Amsterdam, Amsterdam, Netherlands

ABSTRACT

In the Netherlands, academically oriented programmes for primary teacher education have recently been established. The aim of this study is to provide insight in the extent to which graduates from these academically oriented programmes are involved in different forms of inquiry-based working and which factors promote or hinder this involvement. Interviews with 10 academically educated teachers and their school leaders and observations of team meetings were used for this exploratory study. Three forms of inquiry-based working could be distinguished; systematic reflection, using research and conducting research. For most teachers, systematic reflection was part of their daily practice and most teachers made use of research; only a minority was involved in conducting research. Factors like ownership and the role of the teacher in the team were related to teachers' involvement in inquiry-based working. Teachers with a formal research function in inquiry-based working in their schools appeared to be more involved in inquiry-based working, especially in conducting research.

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Introduction

In today's society with continual changes, inquiry-based working is an approach that has become increasingly important for teachers (Cochran-Smith 2009, Ellis and Castle 2010, Darling-Hammond 2017). The term inquiry-based working refers to the involvement of teachers in various activities that incorporate research and the use of the findings thereof in their teaching practice. The involvement of teachers in inquiry-based working is considered important because they are expected to be able to evaluate and innovate their own education to teach their pupils the competences that are important in a changing society (Niemi and Nevgi 2014, Munthe and Rogne 2015). Teachers are also expected to make decisions based on evidence, meaning that they should use research findings and data such as learning outcome or observational data to improve their teaching (Uiterwijk-Luijk 2017).

To prepare student teachers for inquiry-based working, several countries (including Finland, Portugal, France and the Netherlands) have developed teacher education programmes with an academic orientation (Hulse and Hulme 2012, Gray 2013, Niemi and Nevgi 2014, Menter 2015, Darling-Hammond 2017). 'Academic' here refers to a university-based primary teacher education programme in which research is integrated throughout every year of the curriculum to develop academic and critical thinking skills. It is expected that graduates of such programmes will be able to use and conduct research when reflecting on their teaching and on educational issues at the school level (Maaranen and Krokfors 2008). However, little is known concerning the extent to

CONTACT Jan Baan  j.baan@uva.nl  Research institute of Child Development and Education, Universiteit van Amsterdam, Amsterdam, Netherlands

which and how graduates of these academic programmes actually engage in inquiry-based working once they obtain teaching posts and the factors that promote or hinder such engagement. This study focuses on the involvement in inquiry-based working of novice teachers (i.e. those with 0–4 years of teaching experience), who have graduated from an academically oriented teacher education programme in the Netherlands.

Contextual background

The context of this study is initial teacher education for primary schools in the Netherlands. Teacher education institutes have a considerable degree of freedom to organise their own curricula in the Netherlands. There is no national curriculum; only end goals are described, and the educational content is compiled by the institutes themselves.

Since 2008, several measures intended to improve the quality of primary teacher education (PTE) have been undertaken. One of these measures was the development of academic PTE programmes in universities. The regular (professionally oriented) PTE programmes in the Netherlands are bachelor programmes that are offered by institutes for higher professional education (van der Linden *et al.* 2012). These institutes have a more practical orientation than universities, and their attention to research is limited. The aim of academic PTE programmes is to encourage teachers to develop inquiring attitudes to incorporate research findings into their own teaching practices and schools, and to conduct their own research (Snoek *et al.* 2017, van der Wal *et al.* 2018). Academically educated teachers are thus expected to be able to contribute to the improvement of the quality of education in their own classrooms and within their school organisations (van der Wal *et al.* 2018). Both professional and academic programmes provide initial teacher education over the course of a curriculum of 4 years. In both types of programme, there is a strong focus on practical elements, as students spend at least 180 days gaining field experience in primary schools. In the academic programmes, however, more attention is devoted to both academic educational and teacher research. Baan *et al.* (2018) investigated the differences between the role of research in academic and regular programmes in detail. In the regular programmes, student teachers were often found to only be involved in forms of teacher research in their third and fourth years of study. In the academic programmes, however, there was a greater focus on qualitative and quantitative research methods, and student teachers learned how to analyse research findings. In the regular programmes, student teachers conducted small-scale studies, but little attention was paid to analysis of data, validity and reliability. Furthermore, there was a difference in the use of literature: In the academic programmes, the focus was primarily on scientific and international literature, whereas regular programmes were more practical in nature.

Inquiry-based working by novice teachers

The terms teacher inquiry and teacher research are often used interchangeably to refer to research conducted by teachers. However, Munthe and Rogne (2015) note that certain characteristics of research do not necessarily apply to inquiry. The term research refers to the use of research methods intended to produce results for a wide audience, whereas inquiry is focussed on the creation of knowledge within a specific context. In this paper, inquiry-based working is used as an umbrella term to refer to any form of using and conducting research in practice. Inquiry-based working refers to activities engaged in by teachers in which they use literature or conduct inquiries to reflect on their own practices or those of their school organisations. Many different types of inquiry-based working in education have been described in the literature, including self-study (LaBoskey and Richert 2015) data-based working (Schildkamp *et al.* 2012), evidence-based and evidence-informed practice (Biesta 2010, Wiseman 2010), action research and lesson study and design-based research (Chokshi and Fernandez 2005, Zwart *et al.* 2015). Although these types

differ in their approaches, there are similarities in the underlying process. This process is characterised by an intentional and a systematic aspects and is focussed on the improvement of teaching (Cochran-Smith and Lytle 2009, Ellis and Castle 2010).

It may be expected that including inquiry-based working in the curriculum of teacher education would lead to teachers engaging in inquiry-based working following the conclusion of their studies (Maaranen 2010, van der Linden *et al.* 2012 Gray 2013). However, little research intended to verify this assumption has been conducted. A considerable amount of research has focused on the development of the inquiry-based working of student teachers during their pre-service teacher education (Reis-Jorge 2007, Volk 2010, van der Linden *et al.* 2012, Niemi and Nevgi 2014, Parsons *et al.* 2017). However, these studies do not offer much information concerning the involvement of novice teachers in inquiry-based working once they have secured employment at schools, and only a few studies provide insights.

Maaranen (2009) and LaBoskey and Richert (2015) described the experiences of teachers during the first years after the completion of their education. Most teachers were found to use the skills and knowledge that they had obtained during the research projects that they had worked on while writing their master's theses. They were, for example, found to engage in systematic reflection, to share knowledge, to consult scientific and professional literature and to have deeper understanding of their pupils; in addition, some of these teachers were still involved in the research projects that they had begun during the course of their master's theses. However, in a study conducted by Volk (2010), only one-quarter of the 101 teachers interviewed were found to have conducted research during their first years; this is an unsatisfactory result when one considers the amount of time invested in research during initial teacher education. However, the results obtained by Volk (2010) also indicated that almost three-quarter of the teachers interviewed were using the knowledge that they had obtained during the research projects that they were involved in during their education. Butler and Schnellert (2012) found that all 38 of the teachers whom they interviewed were involved in some form of inquiry-based working, although there was a large variety in the systematic character of their inquiries: Some teachers were found to be involved in full action research cycles, whereas others were not found to systematically reflect on their teaching.

Factors that promote or hinder inquiry-based working

Several factors affect the extent to which teachers are involved in inquiry-based working (Borg 2010, Butler *et al.* 2015, Uiterwijk-Luijk 2017). According to a review conducted by Zwart *et al.* (2015), factors such as time, cooperation in research, ownership, a supportive work environment, coaching on inquiry-based working and access to resources influence teachers' engagement in inquiry-based working. Other studies have demonstrated the importance of school leaders in terms of encouraging inquiry-based working (Schenke 2015).

However, it is not clear which factors are related to the involvement of *novice academically educated* teachers in inquiry-based working. There is little research available that focuses on the inquiry-based working of novice teachers and even less on academic novices (Schulz and Mandzuk 2005, Dunn *et al.* 2008, Maaranen and Krokfors 2008, Volk 2010, van der Linden *et al.* 2012). In the Netherlands, academically educated student teachers do appear to be motivated to engage in inquiry-based working after graduation, as they have been found to have had the intention to conduct different types of teacher research, and some mentioned that they had consulted the literature during their initial teacher education to evaluate their practical experiences (Authors *et al.* 2018). Despite this motivation, organisational factors such as time constraints and lack of support in working environments seem to have a negative influence on the actual engagement in inquiry-based working of novice teachers (Schulz and Mandzuk 2005, Volk 2010, Parsons *et al.* 2017). Schulz and Mandzuk (2005) and Parsons *et al.* (2017) found that teachers were overwhelmed by the pressure and the lack of time experienced during their first

years. Even teachers who were motivated to engage in inquiry-based working during teacher education were not able to do so (Schulz and Mandzuk 2005). Schulz and Mandzuk (2005) also found that, in the final year of their studies, the student teachers interviewed demonstrated a negative attitude towards inquiry-based working in schools. They were apprehensive that schools would not be interested in inquiry-based working and that school organisations would not be open to changes or new initiatives in teaching.

Surprisingly, the experiences of the novice teachers interviewed in the study conducted by Schulz and Mandzuk (2005) with regard to school cultures were very positive when compared with the expectations that they had as student teachers. All of the teachers interviewed mentioned a supportive culture with regard to inquiry-based working. However, despite this supportive culture, the impression of being overwhelmed in their first year of teaching limited their involvement in inquiry-based working. These findings might lead one to expect that factors such as time and a supportive work environment may have an important influence on novice teachers' involvement in inquiry-based working.

The present study

Previous studies have focused on the involvement of teachers in inquiry-based working. Furthermore, the factors that promote or hinder the involvement of teachers in inquiry-based working have been described in several studies. However, these studies do not provide insight into the engagement of *novice academically educated* teachers in inquiry-based working. The purpose of the present paper was to identify how inquiry-based working is actually practised in schools and in which types of inquiry-based working academically educated teachers engage in. Academic teacher education programmes are focused on educating student teachers and providing them with the skills required to conduct research and to use research findings. It may thus be assumed that graduates of these programmes will become involved in inquiry-based working once they are working as teachers in schools (Maaranen 2009, Snoek *et al.* 2017). However, little research concerning this assumption has been conducted. Furthermore, the factors that influence the academically educated teachers' involvement in inquiry-based working remain unknown.

Therefore, the research questions investigated in this study are as follows:

- (1) To what extent and how are academically educated teachers involved in inquiry-based working in their initial years as a teacher?
- (2) What are the factors that promote or hinder the involvement of novice academically educated teachers in inquiry-based working?

Method

A qualitative descriptive study was conducted using semi-structured interviews with 10 teachers and their school leaders. In addition, observations were made during team meetings to obtain better insight into the role played by academic teachers in this culture.

Participants

For the purpose of this study, graduates of three academic programmes were selected by purposeful sampling. In total, 43 graduates and their school leaders were approached to participate. Only graduates who had been teaching for at least two days a week were selected. At least three teachers from each programme were selected. Ten teachers and nine of their school leaders were willing to participate in this study; the characteristics of these teachers are presented in Table 1.

Table 1. Characteristics of the participating beginning teachers and indication of whether an observation was conducted.

Name	Sex	Age	University	Experience	Observation
Petra ^a	F	27	A	3 rd year	Yes
Anne	F	26	A	4 th year	No
Steve	M	27	A	4 th year	Yes
Mark	M	25	B	2 nd year	Yes
Lois	F	24	B	1 st year	Yes
Rob	M	24	B	2 nd year	Yes
Caroline	F	24	B	2 nd year	No
Jane	F	24	C	2 nd year	No
Amy	F	24	C	2 nd year	Yes
Marie	F	22	C	1 st year	No

^aPseudonyms are used

Data collection

Interviews

The interviews consisted of questions concerning teachers' involvement in inquiry-based working and the factors that influenced such involvement. The questions in the first part of the interview focused on the extent to which these teachers were involved in different types of inquiry-based working. First, an open question served to determine the teachers' involvement in inquiry-based working. The subsequent questions focused on the teachers' involvement in different types of research known from the literature (including self-study, data-based working, evidence-informed and evidence-based working, action research, design-based research and lesson study). School leaders were interviewed about their experiences with these teachers' involvement in different types of inquiry-based working. The school leaders were also asked if there were differences between their experiences of academically educated teachers and novice teachers from the regular education.

During the second part of the interview, the teachers were asked to indicate whether they had opportunities to engage in inquiry-based working and to identify the factors that influenced their involvement in inquiry-based working. Thereafter, the teachers were asked about the influence of factors known from the literature (time, cooperation in research, ownership, a supportive working environment, coaching on inquiry-based working in the school, access to resources and school leaders), as well as other factors mentioned by the teachers. The questions focussed on how these factors positively or negatively influenced their involvement in inquiry-based working. The duration of the interviews was approximately 45 min for the teachers and 30 min for the school leaders. To enhance the credibility of the findings of this research, two pilot interviews were conducted with teachers who were familiar with inquiry-based working in schools. These teachers gave useful feedback from the perspective of practitioners concerning improving the interview guide and the language used.

Observations

Observations were conducted during the team meetings in which six of the interviewed teachers participated (Table 1). The aim of these observations was to obtain further insight and to be able to illustrate the involvement and the role of the academic teachers in inquiry-based working in their schools. We observed team meetings in which issues related to inquiry-based working, such as analysing test results or discussing research projects, were discussed. The team meetings were all videotaped.

Analyses

The qualitative data obtained from the interviews and observations were analysed using content analysis as described by Miles (1994). The program Atlas.ti (version 7) was used to code the

interviews. The coding scheme was based on the research questions (the types of research and the factors of influence). The results of the analysis were summarised in the form of within-case matrices and cross-case matrices. The cross-case matrices were used for systematic analyses of the involvement of teachers in different types of inquiry-based working and the factors that influence this involvement. This approach provided insight into whether teachers actually engage in the different types of inquiry-based working that are described in literature and how they did so.

The videotaped observations were summarised in the form of a description of the team meetings. For the analysis of these descriptions, the same coding scheme was used as for the interviews.

The trustworthiness of the data was enhanced via several means: The interviews were recorded and transcribed verbatim to prevent interpretation bias. The transcripts were sent to the participants for member checks. All teachers and school leaders responded, and none requested changes. To enhance its credibility, multiple researchers were involved in this project. The coding scheme was repeatedly checked in the research team. Furthermore, the coding of 10% of the interviews was discussed with the second researcher. After this discussion, there was complete agreement. Finally, the cross-case analyses were evaluated by the research team, and direct quotes from the original interviews were included in the results section to illustrate and support the findings.

Results

To what extent and how are academically educated teachers involved in inquiry-based working? (Research question 1)

The interviews and observations revealed a large variety in the extent to which academically educated teachers engaged in inquiry-based working. Most of the teachers mentioned being involved in certain aspects of research types that are known from the literature. For example, they reported observing their colleagues and preparing lessons together (which are aspects of lesson study). However, the cross-case analysis indicated that most of the teachers were not involved in complete research cycles, which are characteristic of research types such as self-study, lesson study or action research. Therefore, another structure for organising the ways in which these teachers engaged in inquiry-based working seemed appropriate. Three main forms of inquiry-based working appeared to cover all of the aspects that were mentioned by teachers, namely, systematic reflection, using research and conducting research. Systematic reflection, for example, includes aspects of self-study and data-based working. Using research includes aspects of evidence-based and evidence-informed practice. Conducting research includes aspects of action research, lesson study or design-based research. [Table 2](#) depicts the teachers' involvement in the three forms of inquiry-based working. The following sections elaborate on the ways in which these teachers were found to engage in these three different forms of inquiry-based working.

Table 2. Involvement of teachers in inquiry-based working.

Name	Reflection	Using research	Conducting research	Experience
Petra	+	+	+	3 rd year
Caroline	+	+	±	2 th year
Mark	+	+	+	2 nd year
Lois	+	+	±	1 st year
Steve	+	+	-	4 th year
Anne	±	+	-	4 th year
Rob	+	-	-	2 nd year
Jane	-	+	-	2 nd year
Amy	+	-	-	2 nd year
Marie	±	±	-	1 st year

Systematic reflection

All of the teachers mentioned that reflecting on their own teaching was a common practice for them. They observed and evaluated their lessons and asked themselves questions about their actions to improve their teaching. When teachers mentioned systematic aspects in their reflection, we coded them as systematic reflection. Five teachers referred to systematic aspects, for example the use of an observation instrument, in their observations. Furthermore, nine teachers reported that they systematically used data in their reflections. These teachers analysed test results and designed teaching plans based on such analyses to improve results. The majority (seven) of the teachers also used sources of information other than test results; for example, they asked children for feedback or conducted interviews to receive more information about their own teaching or about the social-emotional development of children. Steve's reflection practice serves as an example:

I am continuously reflecting on my teaching by using a sort of a research cycle. For example, I use an instrument to reflect on my behaviour in the classroom towards the children twice a year. I analyse the results to see how the children evaluate my behaviour as a teacher. Afterwards, I try to adapt my behaviour on the basis of the results.

The majority (six) of the school leaders also mentioned reflection in the classroom as an important aspect of inquiry-based working by academically educated teachers. They reported that these teachers demonstrated a critical and analytical attitude during their reflections. One of the school leaders made the following observation:

Petra engages in a significant amount of self-reflection. She is very good at indicating when she thinks she is not successful. She comes to me with clearly formulated questions and applies the answers. Her reflection skills are strong.

When comparing the academically educated teachers with those teachers who had received regular education, most school leaders noted differences in the capacity of each group of teachers to reflect from a broader perspective. According to these school leaders, academic teachers reflect not only at the classroom but also at the school level. This capacity to analyse situations at the school level also became evident from their observations. Amy's school leader noted the following:

What I do notice is that she looks very critically at everything, and that is quite special for a starting teacher. That is what I mostly see right now; she is critically analysing. [...] She is quick to identify issues both in both the classroom and in the school organisation and she is not afraid to give her opinion. She is a full-fledged partner.

Using literature

Teachers used literature in different ways. Eight teachers indicated that they use literature in their classroom to inform themselves about behavioural problems of children, for example those related to autism or an attachment disorder. Seven teachers consulted literature about effective learning methods or cooperative teaching methods. Five of these teachers mentioned that they used literature when interventions or new teaching methods were introduced or evaluated in their schools. Caroline, for example, described the way in which she uses literature:

In my class, I always compare what I do with the findings of the literature, and I also check if I recognise the things that are written in the literature in my classroom. I especially use literature that is focussed on behavioural issues and on children who need more help.

Some teachers were critical about the lack of using literature in their schools. They mentioned that in their schools, decisions are not based on literature. A minority (three) of the school leaders mentioned the use of literature by academically educated teachers. Steve's school leader, for example, praised his motivation when it came to consulting the literature and sharing it with the team:

He is more involved in research. He has sources available; he can easily get access to information. There is not a subject that he cannot get an article about to support his opinion. You do not see this in other teachers.

In the majority of the observations, the academically educated teachers referred to literature related to the subjects discussed in team meetings. While we were observing Petra, for example, she shared an article about the research cycle in the classroom during the meeting. Teachers read this article during this meeting, and she guided the team in connecting the article to their specific situation.

Conducting research

Three teachers were involved in research projects focused on the level of the school organisation. Mark and Petra held formal research positions in their school, as they were the coordinators of a research group focused on inquiry-based working. Caroline also participated in a research group. In these positions, these teachers were able to conduct research concerning, for example, interventions in math education or teaching highly gifted children. These three teachers mentioned being involved in aspects of the research process such as formulating research questions in a team, data collection through interviews, surveys or test results, collecting and evaluating these results, writing conclusions and making improvements to the teaching process. Mark described his involvement in conducting research:

There are now three research groups, which focus on Positive Behavioral Support (PBS), highly gifted children and developing the talents of children. We are using the phases of the research process, which is nice because I practiced these phases often during teacher education. We start with a research question, then look for theory, and then we observe or use surveys, and we receive feedback from one another.

While we observed Mark, his role as an organiser of the research process became apparent. For example, he arranged for a student to collect survey data in several classes and to interview teachers and children. He also organised meetings in which the outcomes of the research projects were presented to the entire school team.

Forms of conducting research related to designing lessons were mentioned by only one teacher (Petra). Although five teachers reported being involved in the collaborative preparation of lessons, only Petra mentioned aspects of the cyclic approach that characterises design-based research and lesson study, including collaborative evaluation (e.g. through the observation of colleagues) and making subsequent improvements based on evaluation (Zwart *et al.* 2015):

At the beginning of a new educational theme, we start with designing introduction activities. We do this together with other teachers. However, we have also used external help in organising experiments in the classroom. Then we observe each other and ask 'how do you conduct an experiment in your class?' How can you improve it, and what can somebody else learn from you? [...] It is also my function to stimulate this in the school.

A minority (three) of the school leaders reported that the academically educated teachers were involved in conducting research. For example, they mentioned the role that these teachers played in research groups and their ability to use data. Caroline's school leader made the following observations:

She has the knowledge, and she is able to use the data. She learned this in her teacher education, and she disseminates that knowledge to others. You can see that she is more capable of using data than other novice teachers. We saw this last year with the results of our survey about the pedagogical climate. She said 'give me these results'. She included the results in an Excel sheet, using graphs to provide information about the groups, and presented these results to the team. At that moment, we decided to ask her to join the research groups.

What are the factors that promote or hinder the involvement of novice academically educated teachers in inquiry-based working? (Research question 2)

Teachers mentioned that factors such as ownership, school leaders, time and a supportive working environment were important in terms of their involvement in inquiry-based working. Inquiry-based working also seemed to be related to the years of experience that teachers had at their schools and the respondents' formal research functions.

Most (eight) teachers reported that ownership in their schools had a positive influence. However, teachers interpreted *ownership* in different ways. Some teachers referred to *ownership* in relation to their approach to teaching. Examples of this include having the freedom to make their own choices concerning teaching and to experiment with different instructional or pedagogical approaches in their classroom, as explained by Lois:

In this school, you have a lot of freedom. If we, for example, as teachers of grades 6, 7 and 8, would like to organise an entire week of education around a project, it is possible. One's own initiative is highly appreciated.

This freedom promoted their engagement with inquiry-based working because it stimulated them to experiment with what works in the classroom. Mark, Petra and Caroline also referred to ownership in the sense of having an influence on school policy; they were also involved in inquiry-based working at the level of the school organisation. As Petra mentioned, *In my function, I help to develop the policy about inquiry-based working in the school. Together with a colleague, we write that policy using our knowledge and skills.*

Two teachers experienced a lack of *ownership* when it came to inquiry-based working among colleagues. Anne explained that knowledge within the school was not valued highly by her team members; she felt that they were more focused on external knowledge. She, therefore, expected that research conducted by fellow team members would not be valued highly within the team. This in turn had a negative impact on her own involvement in inquiry-based working.

Four teachers reported that their *school leaders* had a positive influence on these teachers' engagement with inquiry-based working. According to these teachers, an inquiring attitude, a vision with regard to inquiry-based working and the creation of ownership on the part of a school leader are conducive to inquiry-based working in a school. Five teachers reported having had negative experiences with regard to the influence of the school leaders at their schools. They experienced a lack of vision on the part of their school leaders when it came to inquiry-based working or a lack of continuity in the management of their schools, which resulted in inquiry-based working not being considered a priority. Anne described this as follows:

We are now in a situation in which an interim school leader is focused on getting things back on track within the organisation. There is a reason that he is here, and his priority is not to create a vision for inquiry-based working.

School leaders were also mentioned as facilitators of the conditions *cooperation* and *supportive working environment*, which were identified as important when it comes to inquiry-based working. Five teachers mentioned the importance of aspects such as a positive team atmosphere and openness within teams. They also referred to the importance of the structural aspects of a school, such as the organisation of research groups. In schools with such groups, teachers conducted research and shared literature, research outcomes or good practices. Mark described the approach that had been adopted at his school:

On these study afternoons, we share the results of the research process: Where are we? What are we doing? At the end of the year, we organise presentations in which all of the research groups describe their processes and outcomes. Because of this, everybody in the team is involved.

Three teachers reported not having experienced a culture of conducting research in a team as having had a negative influence on their involvement in inquiry-based working. Eight teachers

noted a lack of skills regarding inquiry-based working in their colleagues, who were often for the part not educated at an academic level. These teachers reported that most of their team members did not have the knowledge and the skills that are important when engaging in inquiry-based working. Therefore, they found it difficult to collaborate in inquiry-based working in their schools. Anne noted that *I think I have the skills for inquiry-based working, but most of my colleagues do not have these skills. Therefore, it is difficult to conduct inquiries appropriately.*

Six teachers reported that *time* had a negative influence on their actual involvement in inquiry-based working in their schools. These novice teachers reported having experienced heavy workloads (as a consequence of having just started teaching, working full-time or being responsible for a great deal of administrative work), which made it difficult for them to engage in research work. Marie explained the influence of time as follows:

I am so busy with preparing my lessons and handling other tasks, such as correcting tests and reporting things in the administrative system, that I don't have time to engage in inquiry-based working.

Nevertheless, some teachers mentioned that it is also a matter of teachers themselves being motivated for inquiry-based working and being willing to invest time: *If it is really important to me, I make time for it. In school, I only have a limited amount of time in which to engage in inquiry-based working [...] I am doing it by my own motivation* (Caroline).

Two teachers, with positive experiences concerning time in their school (Mark and Petra), were facilitated for inquiry-based working in the organisation. These teachers had a formal role in the organisation related to inquiry-based working and were, therefore, exempted from other tasks in the school.

Most teachers had not received any *coaching* in inquiry-based working and were, therefore, not able to assess the influence of this factor. Some teachers would appreciate *coaching* in inquiry-based working. Others have had *coaching*, however, they mentioned that the *coaching* was not sufficient because it was not at an academic level as Steve mentioned: *The coach did not have academic skills so she wasn't able to coach me. If someone with an academic background would coach me, someone who is on a higher level, then it would be a positive factor.*

Only one teacher (Mark) had positive experiences with *coaching*. He mentioned that *coaching* stimulates inquiry-based working because most teachers do not have research skills. Furthermore, it helped him for example in searching for literature.

There is always one member of the university in our research group, this is very motivating. She can help with searching for literature. I can also search for literature and coach my colleagues with this. However, it is good to have someone who has been involved in many research projects. I can also learn from it.

Most teachers reported that *access to resources* had no impact on their actual involvement in inquiry-based working. Many teachers indicated that they had been exposed to the literature adequately during their teacher education some were still studying towards master's degrees and thus had access to databases.

Beyond the factors known from the literature, the interviews and the observations also revealed factors influencing inquiry-based working that were related to teachers' *functions* in their schools and their *work experience*. In certain schools, teachers had a *formal research function*, in which they were involved in inquiry-based working. Mark stated the following:

Now I have also become the inquiry leader in school; therefore, I am more visible to others. If people have questions related to inquiry, I am available. I have more influence on the organisation, meetings and the research questions that we investigate within the school.

In the observations, there was a clear distinction between the four observations in which teachers were mainly participants and the leaders of the meetings were external experts and the two observations in which the teachers (Mark and Petra) had *formal research functions*. In the latter observations, the academic teachers, as experts in inquiry-based working, led the meetings. Their

research functions led to their skills with regard to inquiry-based working being recognised. These same teachers mentioned in the interview that they experienced that inquiry-based working was valued within the school organisation and played a role in the school's policy. Three teachers without a specific research function noted that such a function would lead to greater recognition of their roles within their teams. Steve made the following observation:

You need a position or recognition in the school team. Now, some teachers know my academic background, but this does not mean that I have this position at school. I am still a novice teacher to them. I have the feeling that the knowledge that I share is not really appreciated.

Another factor was years of *experience* as a teacher. Two teachers (Marie and Jane) had just started working as teachers a few months prior to the interviews and were, therefore, mainly focused on organising their classes. However, there were differences among those teachers who were in their second, third or fourth years. Some of these teachers were involved in several forms of inquiry-based working in their classrooms and in school organisations, whereas others were completely focused on their own classes. The latter preferred to first learn how to teach and to then to develop themselves through engaging in inquiry-based working. Marie mentioned the following:

I am not sure, but I think the expectations of the people around me are that you are mostly busy with your class and not with the school organisation. [...] In my opinion, you first have to learn to be a good teacher, and then you can become more involved in other things.

Conclusion

The majority of the academically educated teachers interviewed in this study appeared to be involved in inquiry-based working in their classrooms. This mainly involved systematic reflection on their teaching and the use of literature. A few teachers also conducted research at the level of their school organisations. The interviews and observations revealed that factors such as ownership, a supportive working environment, cooperation, school leaders who encourage inquiry-based working and having a formal research function in the school were important in terms of determining teachers' involvement in inquiry-based working and that these factors were often associated. Teachers who expressed positive opinions about these factors and, in particular, those teachers who had formal research functions engaged in a wider variety of forms of inquiry-based working and tended to conduct research more frequently than teachers who had negative experiences with regard to these factors.

Discussion

Inquiry-based working is an approach in which teachers systematically reflect on and attempt to improve or innovate their teaching (Ellis and Castle 2010, Leeman and Wardekker 2014, Mitchell *et al.* 2009, van der Linden *et al.* 2012). To prepare student teachers for inquiry-based working, several countries have developed teacher education programmes with an academic focus (Darling-Hammond *et al.* 2017, van der Wal *et al.* 2018). However, little is known about the extent to which and how graduates of these academic programmes actually engage in inquiry-based working once they have secured teaching posts and the factors that promote or hinder this engagement. The aim of this research was to obtain insight into the extent to which academically educated teachers are involved in inquiry-based working and the factors that influence this involvement.

The involvement of novice teachers in inquiry-based working has only been investigated in a limited number of studies (Maaranen 2009, Volk 2010, LaBoskey and Richert 2015). However, these studies did not focus on academically educated teachers. In addition, their outcomes were not consistent, which might be attributed to the fact that the authors of these works did not define

inquiry-based working in a consistent manner. This study thus contributes to this gap in the literature in two ways: First, this study provides insight into how inquiry-based working is actually practiced in schools. Second, it contributes to the literature by focusing on academically educated teachers. The results indicated that teachers often mentioned certain aspects of research, such as collaborative preparation of lessons or the use of test results. However, most of the teachers interviewed were not involved in the complete research cycles that are characteristic of practice-based forms of research such as self-study, lesson study or action research. Our conceptualisation of inquiry-based working, in which a distinction is made between systematic reflection, using literature and conducting research, contributes to the existing knowledge because this conceptualisation might better connect to the various forms of inquiry-based working that are actually practised in schools.

This study also provides insight into the factors that influence novice academically educated teachers' involvement in inquiry-based working. Such factors have been described in previous studies (Leeman and Wardekker 2014, Butler *et al.* 2015, Zwart *et al.* 2015); however, these previous works did not focus on academically educated teachers. The teachers interviewed in the present study indicated that 'ownership' was an important influential factor. Furthermore, whereas other studies have found that teachers experienced *little* ownership concerning their approach to teaching (Leeman and Wardekker 2014, Parsons *et al.* 2017), which was found to have a *negative* effect on their involvement in inquiry-based working, the majority of the teachers interviewed in our study *did* experience ownership and mentioned that it had a *positive* influence. This might be explained with reference to differences in how teachers interpreted the concept of 'ownership'. Some of the teachers interviewed in the present study valued their influence on school policy, but most teachers reported autonomy in teaching as a factor that had a positive influence on their involvement in inquiry-based working.

This study also identified a factor that has not been mentioned in previous research, namely having a formal research function. Teachers with such a function were found to be more involved in conducting research than teachers without such a function. More specifically, teachers with a formal research function more frequently indicated that they were able to utilise the research knowledge obtained during their academic education. Thus, in this study, having a formal research function was identified as an important factor influencing the involvement of academically educated teachers in inquiry-based working.

The academic teachers interviewed were often the only ones in their schools who had graduated from an academic teacher education programme, and they reported deficiencies in the research competences of their colleagues. Therefore, they experienced few opportunities to collaborate with other teachers with research expertise and to further develop themselves in this regard. Furthermore, the majority of the teachers interviewed reported receiving no coaching in inquiry-based working. Since the rise of academically oriented teacher education in the Netherlands is a recent development, there are not many graduates; therefore, the teachers whom we interviewed were often the only academically educated teachers in their respective schools. Recent literature has indicated that collaborative inquiry via internal or external social networks is a promising approach to teacher professionalisation (Newman and Mowbray 2012, Butler *et al.* 2015, Willegems *et al.* 2017). This study found that academically educated teachers had few opportunities to collaborate with other teacher researchers in their schools (i.e. their internal networks). Therefore, support in the form of participating in an external network that includes academically educated teachers from different schools might be important for these teachers to further develop their research skills.

This study has some limitations, and further research on academically educated teachers is needed. The small-scale design made it possible to obtain detailed insight into the involvement of academically educated teachers in different forms of inquiry-based working and the factors that influence such involvement. However, due to the limited scale of the research design, it is not possible to generalise the results. In future research, it may be interesting to focus on the involvement in inquiry-

based working of a larger group of teachers who graduated from different types of teacher education. Another limitation was that the teachers interviewed in this study varied in teaching experience. They were all novice teachers, but being a first-year or a third-year teacher can make quite a significant difference. It is questionable if it is realistic to expect involvement in inquiry-based working on the part of teachers who have just started teaching (Hulse and Hulme 2012). Further research could focus on the experiences and the development in terms of involvement in inquiry-based working of academically educated teachers over the longer term.

Despite these limitations, this study provides several new insights into the involvement of academically educated teachers in various forms of inquiry-based working. These insights may prove valuable in the development of academic programmes focused on educating teachers. The conceptualisation of inquiry-based working formulated in this article could be used to make conscious decisions regarding the focus on different forms of inquiry-based working in PTE programmes and to prepare academic student teachers for their roles as academically educated teachers in school organisations. Furthermore, the findings of this study could be used to encourage inquiry-based working in schools. School leaders can use the insights concerning inquiry-based working and the factors that influence the involvement of academically educated teachers when attempting to create opportunities for inquiry-based working in their schools.

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ORCID

Jan Baan  <http://orcid.org/0000-0003-0648-7879>

Lisa Gaikhorst  <http://orcid.org/0000-0003-3285-9779>

Monique L.L. Volman  <http://orcid.org/0000-0001-9217-1402>

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