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Increasing the impact of a Master's programme on teacher leadership and school development by means of boundary crossing

MARCO SNOEK, MASCHA ENTHOVEN, JOSEPH KESSELS and MONIQUE VOLMAN

In this case study, we investigate how the development and impact of teacher leadership through a Master's programme can be supported by a design that encourages boundary crossing activities between schools and universities. The case study focuses on 42 experienced teachers from three vocational colleges who were promoted to senior teacher positions and participated in a Master's programme. Through individual and focus group interviews, data were collected on how boundary crossing activities can connect professional development and school development, and on favourable conditions for effective boundary crossing. The study shows that strategic alignment and shared ownership between university and school, a collective approach with multiple participants from one school, and the use of boundary objects, created the conditions through which the Master's programme could serve as a catalyst, stimulating innovation of work practices and development of new leadership practices. The leadership of the senior teachers initiated a development process that shifted from formally mandated forms of leadership to more culturally embedded forms of leadership. This case study leads to a new understanding of design criteria for Master's programmes and boundary objects that can support the process of developing teacher leadership within schools by facilitating boundary crossing between university and school.

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Introduction

Teacher leadership and Master's programmes

In recent years, teacher leadership is increasingly considered as a plausible means to accomplish educational reform and instructional improvement in schools (Poekert, 2012). This teacher leadership can be considered as: 'the process by which teachers, individually and collectively, influence their colleagues, principals, and other members of school communities to improve teaching and learning practices with the aim of increased student learning and achievement' (York-Barr & Duke, 2004, pp. 287–288). Teacher leaders provide direction and exert influence on colleagues to improve teaching and learning outcomes (Katzenmeyer & Moller, 2009; Leithwood & Reihl, 2005). This influence can be exerted through formally mandated leadership—based on formal positions or roles in the organizational hierarchy of the school—or through non-formal leadership, which is embedded in the school's culture, and recognizes the dynamic potential of all teachers to exercise leadership as part of their role (Frost, 2012; Kessels, 2012; Lambert, 2002; MacBeath, 2009).

Several studies emphasize the need for building teacher leadership capacity, stressing that developing teacher leadership in schools requires the development of new qualities of teachers that usually are not part of initial teacher education (Frost & Harris, 2003; Murphy, 2005; Ross et al., 2011). These qualities include expert knowledge and collaboration skills to support colleagues, knowledge on teaching and learning and curriculum design to innovate curricula, expertise on research to diagnose school practices and to use data to improve teaching, and knowledge and skills in the area of change and implementation processes to support innovation processes in schools (Muijs & Harris, 2003; Murphy, 2005).

At the same time, the development and enactment of leadership by teachers implies a change in 'leadership practices' in a school. Leadership (both formal and non-formal) needs to be claimed and granted; it requires the development and internalization of a new understanding of roles, both by leaders and by followers (DeRue & Ashford, 2010). In this process, situational elements—such as structure, culture, routines and instruments—and personal elements—such as implicit leadership theories and self-efficacy—are important (Spillane, 2006; York-Barr & Duke, 2004).

Post-initial qualification programmes such as Master's programmes could contribute to the development of leadership qualities and dispositions by creating opportunities for developing knowledge on teaching, learning and innovation, and a new and wider understanding of their identity as a teacher leader (Danielson, 2007).

A Master's programme that aims to change leadership practices in schools needs to address these individual factors (implicit leadership theories and self-efficacy of the programme participants) as well as the situational factors (organizational culture and structure).

Boundary crossing within the context of Master's programmes

However, the relation between the design of post-initial Master's programmes for teachers and their actual impact on outcomes in schools is complex. A connection is assumed to exist among the design of the learning arrangements; the development of knowledge, competences and skills by the participants in the programme; the actual roles, performance and behaviour of teachers in the classroom and in their team; and the outcomes in schools in terms of student or pupil learning outcomes or school development. Not only cognitive learning processes at the individual level influence this connection but also the complex interrelationship of contexts, purposes and practices in the workplace (Tusting & Barton, 2003).

This complex interrelationship implies that the 'transfer of learning' cannot be defined as a one-way process of passing on discrete knowledge and skills learned within a Master's programme to a new situation in the workplace of the school. Instead, the 'transfer of learning' needs to be understood as a reciprocal process that involves not only a reinterpretation of the work situation and an adaptation of the new competences to the local context of the school, but also a change of the work practices in the school itself (Akkerman & Bakker, 2011; Snoek & Volman, 2014; Tuomi-Grohn & Engestrom, 2003).

In this reciprocal process, two separate activity systems can be identified: that of the school as a working context and that of the university as a learning context (Engeström, 2001; Tsui & Law, 2007). Each activity system has its own dynamics, focused on its intended outcomes, namely, the learning and qualification of pupils versus the learning and qualification of teachers. Within the context of a Master's programme, teachers who participate as students in the programme act as *boundary crossers* because they move across the boundaries between the activity systems. Within the school, they are teachers working with pupils, and within the university, they are students who aim to obtain a Master's qualification. Through boundary crossing, ideas from different cultures meet, contradictions between these cultures are resolved and new meanings are generated (Gutiérrez, Baquedano-López, & Tejeda, 1999). Boundary crossers can act as 'brokers', introducing new elements from one community of practice to another (Tsui & Law, 2007; Wenger, 1998). In this way, boundary crossing can lead to *expansive learning*, in which the participants not only develop their knowledge, competences and skills but also reconstruct their own context (Engeström, 2001). The Master's programme can be considered to be a *boundary zone*, creating a context in which the two activity systems can interact and boundary crossing can take place (Miedema & Stam, 2008; Tsui & Law, 2007). Boundary objects can facilitate the process of expansive learning; these are concrete objects, artefacts or processes that encourage and facilitate interaction between the activity systems (Star, 1989). The Master's thesis that is part of a Master's programme can be considered to be this type of boundary object.

Favourable conditions for effective boundary crossing

However, this process of boundary crossing between the learning context and the work context is complex, and expansive learning cannot be taken for granted. Most Master's programmes are characterized by individual subscriptions resulting in only one boundary crosser from each school, creating a weak context for expansive learning. Due to the formal qualifying nature of Master's programmes, both universities and schools see Master's programmes mainly as a tool for individual professional development and less as a tool for school development (Snoek & Volman, 2014). Studies in the domain of human resources have addressed this issue by emphasizing the 'corporate curriculum', the organization's perspective on a learning design that aims to obtain mutual effects at the level of individual and organizational behaviour, bridging individual professional development and school development (Kessels, 1993). A corporate curriculum aims for external curriculum consistency: 'the homogeneity of the notions of parties involved on what the problem is and how it can be solved by means of educational provisions' (Kessels & Plomp, 1999, p. 682). This concept implies that the alignment of aims, the design of the programme and favourable conditions for the effective application of newly developed competences in schools are the shared responsibility of the programme designers at the university and of key stakeholders in the school.

The notions of boundary crossing and external curriculum consistency suggest that Master's programme designs that intend to stimulate expansive learning need to be based on a strategic alignment between the expectations of programme leaders at the university and the key stakeholders at the school, on a shared feeling of ownership and on the possibility of taking themes from the school practice as a topic for further study during the Master's programme. In addition, boundary crossing can be strengthened when it is not restricted to an individual participant who is an isolated boundary crosser. When multiple participants from a single school participate in the programme, and when their supervisors and university teachers from the Master's programme also actively participate in boundary crossing activities, the potential for expansive learning might be increased.

In this case study, we take a closer look at a Master's programme that focuses on developing teacher leadership. By encouraging boundary crossing between the two systems of school and university, this programme aims to contribute to individual professional development as well as to school development.

Studying the impact of a Masters' programme

To study the effectiveness of a Master's programme, we need to examine the design of the learning arrangement; the development of knowledge, competences and skills by the participants in the programme; the changes in the actual roles, performance and behaviour of teachers within the classroom and the school; the contribution to school development in

terms of changes in work practices and leadership practices; and the individual and organizational factors that influence the connections among these elements.

Many studies have shown that learning arrangements focusing on individual professional development have a weak relation to actual improvements at the work place. Hackman and Oldham (1980) indicate in their job characteristics model that changes in workplace performance are related to core job characteristics. Mayrowetz, Murphy, Seashore Louis, and Smylie (2007) used this finding to develop a model to understand the impact of distributed leadership in schools. In this model, they understood distributed leadership as a change in work design, relating the redesigned work and the outcomes in terms of leadership performance and school development. The model 'contains our best understanding of how and why efforts to develop distributed leadership in schools would operate and serves as a starting point for predicting the success (or failure) of these reforms' (Mayrowetz et al., 2007, p. 75). As the aim of the Master's programme was to develop distributed leadership in schools, we used this model in an adapted form to understand the impact of the programme on individual professional development and school development.

The resulting conceptual model (Figure 1) illustrates that through design characteristics that focus on active boundary crossing and external curriculum consistency between university and school (1), the Master's programme can contribute both to the qualification of individual participants (2) and to changes in the school culture and structure (6). Both individual development and changes in the school culture and structure

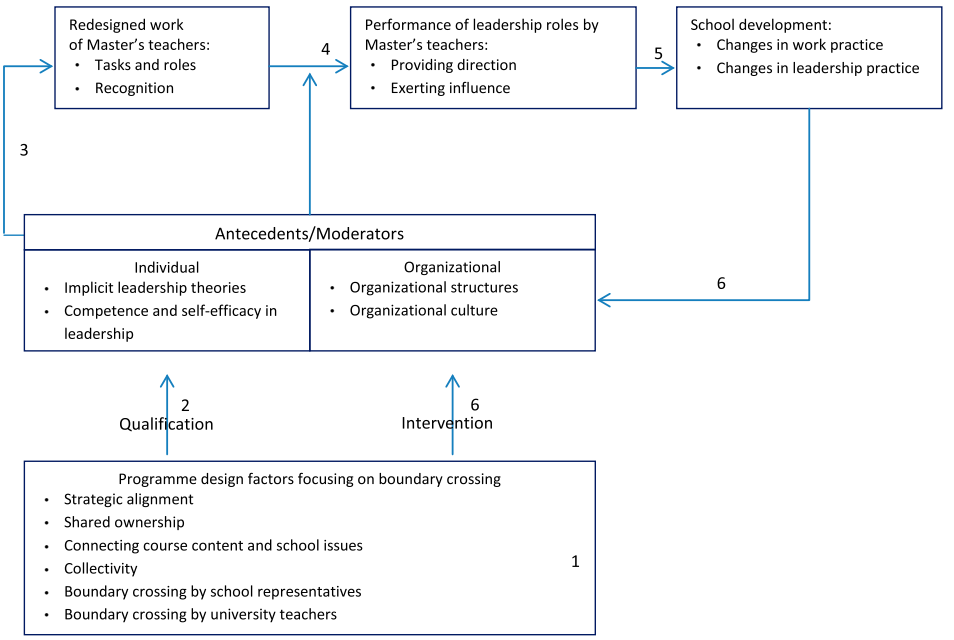

Figure 1. Conceptual model for evaluating the effectiveness of a Master's programme on leadership performance and school development

result in a redesign of the workplace in terms of new tasks and roles after having followed the Master's programme, stemming from the recognition of newly developed qualities (3). Through these new tasks, roles and recognized qualities, the Master's teachers should be able to exercise leadership in terms of providing direction and exerting influence within their team (4), leading to school development in terms of changes in their daily work practices and those of their colleagues and in terms of changes in the leadership practice within their team or the school as a whole (5). Finally, changes in work practices and leadership practices can influence organizational structures and organizational cultures, which are considered to be moderators for the impact of the Master's programme on school development (6). Thus, a reciprocal process is created in which Master's teachers themselves can contribute to the creation of favourable conditions for teacher leadership and to a climate that is focused on organizational learning (Snoek & Volman, 2014).

Objective and context of this study

The objective of this study was to investigate how a Master's programme that focused on teacher leadership and that was designed to strengthen boundary crossing between school and university contributed to individual as well as school development. Based on the conceptual model presented in Figure 1, we addressed the following research questions:

(1) To what extent and how does the programme create and support opportunities for boundary crossing between school and university?
(2) What is the impact of the programme on individual factors?
(3) To what extent do participants experience a redesign of their work that requires the use of leadership competences?
(4) What is the impact of this redesign of work on the leadership roles of the participants?
(5) What is the impact of these leadership roles on school development in terms of changes in work practices and leadership practices?
(6) How do organizational factors influence the impact of leadership roles, and how are these factors changed by the leadership roles of the participants?

The object of the study was a post-initial, two-year, part-time Master's programme in teacher leadership competences that was offered by teacher education institutes in Amsterdam since 2009. The post-initial character of the programme implied that participants were experienced teachers who had completed their initial teacher education and who had been teaching for several years in colleges for vocational education, preparing students aged 16–21 for mid-level professions. These teachers followed the 60 credit programme along with their teaching job. The participants were 42 experienced teachers from three vocational colleges who had

been selected and appointed by their employers as senior teachers. Their appointment as senior teachers implied that they joined the Master's programme.

The curriculum of the Master's programme was focused on developing the knowledge, skills and attitudes required for teacher leadership. The red thread in the programme was a research project to be carried out in schools, addressing a specific problem in teaching and learning. This was supported by lectures that addressed theories on teaching, learning, teacher development, curriculum development, innovation dynamics and school organization. Additionally, the participants were supported in reflecting on and rethinking their role as a teacher leader, and in using their research project to improve teaching and learning in their schools and to support their colleagues in this endeavour. Examples of the topics for research projects are mentioned in Table 1.

This focus on teacher leadership is closely connected to the national debate in the Netherlands, where there is a widely shared awareness that teachers are key actors in improving the quality of education and schools, while at the same time they have been marginalized in decisions on curriculum changes. In recent years, a consensus has developed, both by teacher unions and the ministry of education, that teachers should take a leading role in curriculum decisions in schools (Kessels, 2012; Ministerie van OCW, 2011; Onderwijsraad, 2007, 2013; Snoek & Dietze, 2007). That key role requires new leadership qualities of teachers that extend beyond the context of their classrooms, and influence colleagues and the school as a whole.

The curriculum of the Master's programme had been adapted based on prior experiences to strengthen opportunities for boundary crossing (Snoek, 2013): the aims of the programme were closely connected to the ambitions of the vocational colleges in terms of school development; the programme was developed and monitored in close cooperation between the university and the vocational college staff; and assignments were designed in such a way that connections between curriculum content and local issues were stimulated; and resulting essays or other products could be shared with supervisors (e.g. team or department head) and colleagues. Between 10 and 20 teachers from each vocational college participated, and human resource development (HRD) staff and supervisors from the vocational colleges were invited to participate in lectures and key sessions on research questions for the participants' thesis projects.

Two of the four authors of this study were involved as external advisors to the teaching staff and supported quality improvement of the Master's programme.

Focus and methodology

Research design

The study was designed as a collective case study (Stake, 1994). Data were collected with the participants in the Master's programme, who

Table 1. Characteristics of the three vocational colleges

School 1 has 12,000 students distributed across different locations and different departments. Each department has a director and several managers; the managers are each responsible for several teams that provide the curricula for a specific vocational programme. The respondent from the strategic management level characterized the school as changing from a managerial and hierarchical organization to a learning organization with a focus on teaching quality and staff development. The internal HRD Academy is responsible for providing professional development programmes. This HRD academy is a sparring partner for the university staff team in terms of creating strategic alignment between the course goals and the agenda of School 1. The HRD Academy also plays a key role in arranging group meetings for the 18 senior teachers to discuss their roles and to exchange experiences and expertise (knowledge cafes) and sessions for the senior teachers and management of the school to position the senior teachers and to stimulate a shared understanding of roles and responsibilities

Examples for thesis research projects:

- Transfer between theory and practice in in-company vocational health education
- The relation between care for special needs students and professional identity of teachers

School 2 is relatively small; it has 5500 students in six locations and several departments. Each department has a director and a number of self-steering teams. Each team is responsible for developing, delivering and assessing its vocational programme and for making decisions on task division among team members. Within each team, there are coordinators appointed with special responsibilities. The coordinators meet in school-wide platforms to make adjustments to different programmes. The structure of self-steering teams demands high-quality awareness from all staff and a commitment to students and colleagues. Seven senior teachers participated in the Master's programme. The head of the HRM department has been the sparring partner for the university staff team in terms of creating strategic alignment between the course goals and the agenda of School 2

Examples for thesis research projects:

- Fighting early school leaving through curriculum design
- Sharing of professional experiences between students during practice periods

School 3 has 8500 students in two locations with several departments. Each department has a director and different managers who are each responsible for several teams that provide the curricula for a specific vocational programme. The focus of the school's change agenda is to improve teaching quality in each of the programmes. This goal requires leadership and pedagogical professionalism from teachers. The appointment of 17 senior teachers fits with this ambition. A representative of the HRM department and one of the board members have been the sparring partners for the university staff team in terms of creating strategic alignment between the course goals and the agenda of School 3. After the start of the Master's programme, the school faced severe financial problems. As a result, there is a strong focus on efficiency. This focus also applies to the senior teachers: their impact should be as wide as possible, not focusing on one specific team or vocational programme but rather aiming for school-wide relevance and impact

Examples for thesis research projects:

- Fighting early school leaving through bonding of students
- Strengthening the assessor quality of vocational teachers

originated from three vocational colleges that offer vocational programmes in a wide variety of professional areas for students aged 16 and over. Although the participants followed the same Master's programme, their working contexts differed with respect to organizational structures and cultures. As boundary crossing activities manifested differently in the three contexts, the three vocational colleges could be considered as subcases (see Table 1).

Through this collective case study, we aimed to gain a deeper understanding of how—in these specific contexts—boundary crossing was experienced and understood, and how participants, university teachers, supervisors and management in the three schools differed in their perception of the impact of the Master's programme on school development.

Respondents

Several groups of respondents contributed to the data collection. From each college, three participants in the Master's programme were selected. The criteria for selection were that the participants were from different professional areas (health care, economics and technology) and were not lagging behind in their study progress. Eight participants agreed to participate. As self-reporting by participants who have been immersed in the programme can only give a limited and subjective view of the impact of the Master's programme and might show how 'they had learned to talk the talk' (Ross et al., 2011, p. 1217), additional sources were used to guarantee triangulation. Interviews have been conducted with the supervisors of each of the participants and as well as with their university teachers. Finally, interviews were conducted with key stakeholders in the area of HRD in each of the colleges.

After being informed about the aim of the interviews and being guaranteed anonymity, all respondents gave their consent for the use of the interview data.

Instruments

To answer the research questions, we used a number of instruments for data collection (see Table 2). Through individual semi-structured interviews, the perceptions of the eight participants and their supervisors were recorded. The university teachers were interviewed in pairs. HRD staff members from the three vocational colleges were interviewed to provide the context of the Master's programme in each college.

Along with the individual in-depth interviews, additional data were collected focusing on the impact of boundary crossing by the full group of participants. In a peer group interview with the university staff, boundary crossing and the role of the university teachers were discussed. At the level of each vocational college, a focus group meeting was arranged with the strategic management of the college, two participants and two supervisors (differing from those interviewed), focusing on the perceived impact of the Master's programme on the vocational college as a whole. Finally,

Table 2. Overview of key concepts and data collection instruments

			Research instruments						
			Individual level			(Sub) case level			
Research question	Key concepts	Indicators	Individual interviews with participants	Individual interviews with supervisors	Pair interviews with university teachers	Individual interviews with HRD staff	Focus group interviews at school level	Recorded university staff meeting	Recorded meetings of monitoring group
		N=	8	8	3	3	3	1	6
Q1: Master programme as boundary object	Course design factors	Strategic alignment/ external curriculum consistency Shared ownership Content relevance of course themes for the school Collective approach Boundary crossing by supervisors Boundary crossing by university teachers	x	x	x	x		x	x
Q2: Individual characteristics	Implicit leadership theories	Leadership theories of participants	x	x	x				
	Competency and sense of (self-) efficacy	Pupil learning Innovation Research Supporting and inspiring colleagues	x	x	x				
Q3: Characteristics of (redesigned) work	Job characteristics	Changed tasks and responsibilities New roles	x	x	x	x	x		x
	Recognition	Recognition by supervisor Recognition by colleagues Job satisfaction	x	x	x	x	x		x
Q4: Application of leadership role	Providing direction (content)	Initiating new developments Giving direction to developments	x	x	x		x		x

(*Continued*)

Table 2. (*Continued*).

			Research instruments						
			Individual level			(Sub) case level			
Research question	Key concepts	Indicators	Individual interviews with participants	Individual interviews with supervisors	Pair interviews with university teachers	Individual interviews with HRD staff	Focus group interviews at school level	Recorded university staff meeting	Recorded meetings of monitoring group
		Monitoring and adapting developments							
	Exerting influence (process)	Role in decision making Coaching and supporting Creating support	x	x	x		x		x
Q5: School improvement	Impact on working practices	Impact on content Impact on teaching methodology Impact on knowledge and expertise Impact on structure Impact on culture	x	x	x		x		x
	Impact on leadership practices	Changing role of supervisor Changing role of Master's teacher Changing role of colleagues	x	x	x		x		x
Q6: Organizational characteristics	Organizational structure	Structure Stability	x	x	x	x	x		x
	Organizational culture	Leadership theories of supervisor and colleagues Focus on learning Mutual trust Recognition, granting and claiming of leadership	x	x	x	x	x		x

six meetings of a monitoring group consisting of university teachers, HRD stakeholders, and representatives of participants and supervisors were recorded.

All interviews and focus group meetings were conducted in the final semester of the Master's programme. To structure the interviews, we used the conceptual model of Figure 1 to identify key concepts and indicators (see Table 2). These indicators were used to design the interview protocols and to analyse the interviews.

The interviews were divided between two researchers and lasted 60–90 min each. The interviews were recorded and transcribed verbatim.

Data analysis

The indicators listed in Table 2 were used as a coding scheme to analyse the interviews. The coding scheme was discussed between two researchers to reach agreement on the interpretation of the codes. These two researchers performed the data analysis, using MAXqda software for computer-assisted qualitative data analysis. This software creates the opportunity to attach codes to text fragments and to select text fragments with similar codes across interviews. With the use of the coding scheme, the interviews were summarized in two steps:

- Each interview was summarized using the coding scheme. These summaries were used to draw *individual participant descriptions* that combined participant, supervisor and university teacher perspectives. Individual participant descriptions were combined into *subcase descriptions* in which the interview data from one vocational college were combined. Finally, the three subcases were compared, creating a *whole case description*. At all three levels (participant, college and whole case) attention was paid to possible incongruency of perspectives, and to both similarities and differences between participants and between colleges' results. The two researchers discussed differences in summaries and interpretation until full agreement was reached.
- In the second step, a cross-case analysis was conducted (Miles & Huberman, 1994), combining all responses with a specific code to uncover overall patterns and themes linked to each research question.

Validity and reliability

By interviewing senior teachers, their supervisors and their university teachers, triangulation was created, increasing the reliability of the outcomes. The outcomes of the cross-case analysis and the individual participant and subcase summaries were compared to ensure consistency. Based on these two outcomes, overall and subcase patterns were identified.

To guarantee the validity of the outcomes, the subcase patterns of each vocational college were summarized and reported in a focus group

interview at each school to create a member check (Creswell, 2012) and to discuss the implications of the outcomes for further policy development within the school. These focus group interviews were used as additional data sources that contributed to the construction of a complete picture for each school.

Through the use of a collective case study with different subcases including three colleges with different structures and cultures, and by in-depth interviews with participants and their supervisors from different departments, the design created a sufficient level of transferability to other contexts (Lincoln & Guba, 1985). The qualitative approach creates a closer understanding of the dynamics of the processes of leadership development and boundary crossing in schools.

Results

In the next section, we present the outcomes of the analysis of the interviews and focus group meetings. In the presentation of the outcomes, we summarize the responses from the different respondents and illustrate these responses with typical quotations from the interviews. The responses from the different stakeholders were in most cases congruent. Where there was no congruency, this is mentioned. In the presentation of the results, the responses from the three schools are only discussed separately when differences arose among the schools.

Boundary crossing between school and university

The Master's programme was designed in such a way that boundary crossing was stimulated using the design criteria listed in Figure 1. The interviews focused on how participants, their supervisors, their university teachers and other stakeholders perceived this boundary crossing.

Strategic alignment. Boundary crossing had already started in the process of designing the Master's programme. Key stakeholders in HRD in the vocational colleges and university representatives had contributed to the design of the programme by connecting the ambitions of the schools with the aims of the Master's programme. These ambitions recognized that self-steering teams of teachers need to assume responsibility for curriculum development, learning results and pedagogical mastery. To support such self-steering teams, senior teachers should play a key role, while Master's programmes should support these senior teachers in assuming that role.

According to all respondents, the boundary crossing during the design phase resulted in a Master's programme that combined and linked professional development at the Master's level with school development and human resource strategies (such as the differentiation of salaries).

> Suddenly, we could take a huge step in terms of lifelong learning and increasing the quality of our teaching. By appointing senior teachers, we could speed up our ambitions. (HRD staff, School 1)

Alignment was visible in the similar expectations of the Master's programme participants, their supervisors, the HRD stakeholders and university teachers that senior teachers would act as teacher leaders in initiating curriculum innovations, supporting colleagues and advising management. During the interviews, necessary leadership qualities were identified, namely, a thorough knowledge of teaching, learning and curriculum design; an inquiring mindset; and an awareness of organizational structures and dynamics.

Shared ownership. This mutual understanding was the basis for a shared sense of ownership and collaboration between the schools and the university. A monitoring group was composed—consisting of HRD stakeholders, representatives from the group of participants and supervisors, and the team of university teachers—to monitor how the aims of the schools and the university were met. An ongoing topic of discussion within this group was the shared responsibility of both the school and the university to challenge the senior teachers to apply their leadership competences within the school. Through these meetings progress was monitored and, where necessary, the programme was adapted.

> The collaborative assignment in the last semester needs to be closely connected to the change agenda of the schools. That connection is not clear enough. It could be improved by stimulating a structured reflection on that change agenda by the senior teachers. Discussion followed on the question whether this collaborative assignment should be arranged in separate groups focusing on one specific school, or whether it should be arranged in mixed groups. (Minutes of the monitoring group, November 2012)

The *monitoring groups* acted as a boundary object, where all stakeholders involved in the Master's programme met to discuss the design and implementation of the programme. This group discussed opportunities to increase impact and involvement of supervisors, which were translated into suggestions for improving the programme and strengthening its integration in the school.

This shared feeling of ownership remained limited to the participants of the monitoring group. Both the individual senior teachers and supervisors who were interviewed indicated that they had little to no influence on the content of the Master's programme; the negotiation of programme content and design had occurred at a strategic HRD level in each school, with little involvement or ownership by individual participants or supervisors.

Content relevance. Most participants and their supervisors indicated that the academic content of the Master's programme was relevant and could be applied in their daily work. Most participants felt inspired to share the knowledge they acquired in the programme with their colleagues and supervisors, and to use this knowledge as a new perspective on daily problems and issues.

> He is now working on an essay on learning careers. That is closely connected to our curriculum in which we try to focus on individual learning paths for students. So, yes, it is very relevant, as there are lots of connections! (Supervisor of senior teacher 2, School 1)

In particular, the research project that was designed as a thread running through the programme created opportunities to bridge the academic aims and content of the Master's programme and issues in the schools. The *research project* could be considered as a powerful boundary object as it provided tools for reflection, analysis and new perspectives on issues within the teachers' daily practice.

However, for two participants, the different aims and expectations of the two activity systems created contradictions and conflicts as they struggled with the formal requirements of a Master's-level programme in terms of academic rigour. These requirements focus on documented proof of Master-level skills through essays and research papers judged by formal Master's-level criteria. They felt that the focus on these criteria and formats conflicted with their practice-oriented learning style, and thus impeded the connection of their learning to their daily practice and that of their colleagues.

Moreover, some supervisors had no clear idea regarding how research could fruitfully contribute to school development after completing the Master's programme. They acknowledged the need for an inquiring attitude but saw very few opportunities for senior teachers to engage in research activities in their future work.

Collectivity. The design of the programme aimed to engage a larger group of participants from each school in the programme, spreading boundary crossing over several boundary crossers. Responses with respect to this element of the programme design focused on two aspects: the collective impact of the senior teachers on their organizations and the mutual support within the group of senior teachers.

Supervisors and HRD staff emphasized that the large group of senior teachers generated a critical mass within the schools, as they simultaneously created several 'breeding places' for innovation. School leaders, department heads, senior teachers and colleagues all realized that by defining a new senior teacher profile with an adjusted salary scale and promoting a group of 42 senior teachers according to this profile, a momentum had been created that could not be ignored in the schools. Throughout the two years of the programme, questions on their roles and expectations were raised at several levels, creating a continuous awareness of the existence of this new group of teacher leaders.

> I believe that it is an added value that there are more senior teachers within our unit, that they are not isolated. This creates movement at different places at the same time. (Supervisor of senior teacher 1, School 1)

The senior teachers appreciated the collectivity of the programme: they felt supported by their colleagues participating in the programme, they extended their network within their schools across teams and departments, and they became aware of the personal qualities of their fellow senior teachers. They also considered their collectivity to be a lever for influencing school-wide policies and for acting as a think tank within their school.

The three schools varied in how they fostered this collectivity. In School 1, the internal HRD Academy played a key role in bringing together the group of senior teachers in knowledge-sharing sessions, and in giving them a collective role during internal conferences and management sessions. In School 2, few collective activities were organized, restricting teacher leadership activities mostly to the level of the team or department, whereas in School 3, the senior teachers organized their own shared sessions together with the staff unit for curriculum development.

Boundary crossing by school supervisors. In the design of the programme, the aim was to engage the participants' supervisors in programme activities by inviting them to key sessions in the students' research projects and to guest lectures that were part of the programme. In the first semester, *collaborative research sessions* were organized in which research themes and research questions were discussed between participants and supervisors. These sessions were considered to be fruitful for finding a match in expectations between schools and the university, and for developing a shared understanding of local needs and academic criteria for practice-oriented research. After this collaborative start, the supervisors had little involvement in the research projects until the final semester, when concrete outcomes could be shared, and the implications for teams and curricula and the possibilities for wider dissemination could be discussed.

According to the respondents, the intended participation of supervisors in the *guest lectures* was considered to be a less-effective boundary activity. Most supervisors attended only two or three out of the 15 guest lectures in the programme. Their motivation to do so was mostly expressed as interest in the well-being of their senior teachers and as recognition of their engagement in the Master's programme.

> Actually, it is mostly valuable for him, as a kind of recognition: Oh, my supervisor is willing to travel to Amersfoort just for me! (Supervisor of senior teacher 8, School 3)

Attending guest lectures was not considered to be a useful method for personal professional development by the supervisors. Thus, the guest lectures could not be considered as effective boundary objects, as they were experienced as non-committal and without additional value for the supervisors. The guest lectures did not aim for a mutual and collaborative learning process among senior teachers, supervisors and other colleagues. According to one of the participants, this might be due to the supervisors' lack of active involvement in meaningful learning activities. This participant suggested that he would prefer a shared assignment for participant and supervisor that linked the content of the lecture to the local situation at the school. Another participant suggested that the guest lectures might be a more-effective boundary object if, in addition to supervisors, other colleagues from her team could participate, providing input for follow-up discussions within the team.

Boundary crossing by university teachers. Boundary crossing activities do not need to be restricted to supervisors and colleagues engaging in

activities of the Master's programme, they also can involve university teachers engaging in activities at the school. However, this type of boundary crossing did not occur. As the design of the programme did not provide meaningful boundary activities connecting the university teachers to the school context, the university teachers were reluctant to join activities in the schools. As a result, the university teachers had very little information about the actual context of the participants and about their performance in applying Master's qualities at the workplace.

> The only role I see for myself is to support the senior teachers in such a way that they can claim their role within their school, that they can negotiate with the management of their school. It is not our role to intervene directly within the schools. (University teacher)

The participants and supervisors had mixed feelings regarding the possible involvement of the university teachers in the school. On the one hand, they had difficulties imagining meaningful boundary activities and noted the risk that university teachers could be seen as external busybodies without real engagement or understanding of the local context, which would threaten the authority of supervisors. On the other hand, more involvement of university teachers in the school context was welcomed, as it could increase the involvement of the supervisor in the Master's programme, could bring more expertise into the school to solve tough problems, and could contribute to a stronger fine tuning between university and school with respect to content and the roles of teacher leaders.

> We are talking about learning communities and network learning. It should be possible to organize it in such a way that a learning community with a supervisor, two or three senior teachers and a university teacher analyse problems and give feedback to each other. (Senior teacher 6, School 2)

The sparse participation of supervisors in boundary crossing and the absence of boundary crossing by university staff may play a significant role in the limited impact of the programme, and indicates the need to search for new boundary objects that invite for a stronger shared discourse.

Individual characteristics and redesigned work

This section will focus on research questions 2 and 3: the impact of the Master's programme and boundary crossing on the individual characteristics of the senior teachers and the redesign of their work (in terms of new tasks and roles).

Changes in individual competences, self-efficacy and personal leadership theories. The senior teachers indicate that they have developed their knowledge, competences, skills and sense of self-efficacy with regard to teaching, learning, organization and innovation. They indicate a strong development of their sensitivity to organizational and change processes, and the development of their research and analytical skills. Moreover,

they have developed an inquiring attitude, a helicopter view and an awareness of the wider context. Their supervisors recognize these new qualities.

> For years, I had the feeling of being too far ahead of colleagues. I missed the tools to close that gap and to get them on board. Now, I have acquired these tools, and that feels very good. (Senior teacher 6, School 2)

> I see a large difference from a half-year ago. At that time, they were very much dependent on the opinion of their supervisors, e.g. on which research topic to choose. Now, they are much more independent, define their own focus and priorities. (University teacher)

The collective approach that was part of the design of the programme was effective in developing a shared understanding of the senior teachers' leadership role. This shared understanding contributed to changes in professional identities and personal leadership theories (as defined by Spillane, 2006), which were characterized by a proactive and independent attitude, self-awareness, initiative and entrepreneurship. Through this new and collective understanding of their leadership role, the senior teachers are able to avoid pitfalls and to avoid reverting to previous patterns.

> The funny thing is that when some are starting to complain about school structures or cultures, they immediately correct each other: hey, we agreed not to do this anymore! What is the underlying problem and what can we do about it? (HRD coordinator School 1)

During the interviews, the senior teachers expressed personal leadership theories. Their conviction is that curriculum innovation cannot be initiated top-down, but rather that it requires dialogue and shared responsibility at different levels. These teachers see themselves as mediators between different levels in the school, bridging administrators and teachers, and trying to build mutual understanding.

> The time is over when innovations were pre-cooked by some small taskforce, remote from the daily practice in classrooms. The real change will be in how we will cooperate across internal boundaries. It should be a shared understanding that we will need each other to accomplish something. Education and all the processes around it are so complex that it can't be arranged and solved at the top. (Senior teacher 6, School 2)

Characteristics of the (redesigned) work. As the management of the three schools realized that the participants at the Master's programme needed sufficient time for their learning process and programme assignments, it was agreed that the real start of their new teacher leadership role would be after graduation. This was most explicit in School 2.

In the other schools, new tasks had gradually been given to the teachers that were related to the redesign, innovation and coordination of curricula; support and coaching of teams and colleagues; and being a partner for their supervisor. As the selection of the participants in the Master's programme was based on their seniority within their team, most of them had already performed tasks related to coordination, curriculum development or innovation projects.

Although there was little change in formal tasks, all respondents indicated that they performed their tasks differently, assuming new roles by using a deepened understanding of theories on teaching and learning; a wider perspective on their team, curriculum and organization; a more inquiring attitude; a stronger focus on sharing knowledge; and through all of this, a stronger sense of self-confidence and authority. The boundary crossing activities stimulated these teachers to see themselves, their tasks and their contribution to their school in a different way.

> Before I started this study, I did things differently. I searched for something on the Internet, took some information from national conferences, but that was about it. The study makes me look not only for the theory but also makes me aware of the processes at school and the organization behind it. It makes me sit back to analyse the whole process: are we doing the right things, does everything fit? For me, that is the added value, that stronger awareness. (Senior teacher 6, School 2)

In some cases, senior teachers and supervisors expressed different expectations, as some supervisors emphasized the teaching roles of senior teachers, while their senior teachers expressed the wish to have less teaching responsibilities in order to be able to use their new leadership abilities with colleagues.

Impact on leadership roles and school development

This section focuses on research questions 4 and 5: the leadership performance of the senior teachers (in terms of providing direction and exerting influence) and the impact of this leadership performance on school development (in terms of changes in work practices and in leadership practices).

Performance on leadership roles. The senior teachers' new understanding of their leadership role and their contribution to their team led to a change in their performance. They developed a stronger awareness of the issues and developments in the school as a whole, the workplace and society. The senior teachers *provided direction* to their colleagues and supervisors, because they felt able to contribute new perspectives, to anticipate external developments, and thus to influence the agenda of their team and their supervisor.

> I tell my supervisor and colleagues about new developments and opportunities at the national level that are coming and how we have to deal with these; that if we don't anticipate and make decisions, we will miss opportunities. (Senior teacher 6, School 2)

Several senior teachers indicated that their focus shifted from administrative coordination to curriculum leadership. They became less focused on quick solutions to problems. Through a more inquiring attitude, these teachers developed an inclination to first analyse problems, and to look for relevant literature and theories before jumping to solutions.

> We have a very strong tendency to react *ad hoc* to issues. I learned through those research projects to value what research can mean for our daily practice: that it can create a break in the daily race, that you don't need to have an answer right away. (Senior teacher 1, School 1)

In providing direction, the focus of the senior teachers varied. All senior teachers widened their perspective from their team to other teams within their department, sometimes in close cooperation with other senior teachers. In School 3, for example, the senior teachers were given an explicit role across departments to support teams in the process of curriculum redesign.

The senior teachers' *influence* focused not only on curriculum content but also on the development and support of colleagues and teams. With the input from the Master's programme, the senior teachers developed a stronger awareness of the professional development of the team as a whole. They stimulated collaborative discussions on teaching and learning, providing input from theory, and they coached their colleagues and emphasized the individual qualities of team members and their contributions to the team as a whole.

> I organize study meetings and write a newsletter. Through this, I make a connection with what is happening outside our school and what is relevant for our teams. In the newsletter, there is a special column for colleagues who follow CPD courses to share this with other colleagues. In this way, people become aware of each other's qualities and can make use of them. (Senior teacher 1, School 1)

Several senior teachers tried to stimulate the self-awareness of their team, building their capacity as a self-steering team and building a proactive relationship with their manager, thereby influencing the leadership practices in their school.

> I try to influence the attitude within our team. That people are not sitting back passively, waiting for what will happen to them. That they take the initiative themselves. Our team has now become much more proactive and therefore a much more equal counterpart for the head of our department. This also generates lots of positive energy, and other teams recognize this. (Senior teacher 1, School 1)

In several cases, there was a discrepancy between responses from supervisors and senior teachers, as several senior teachers indicated that they struggled with their role within their teams and felt unsure of their leadership role, while their supervisors and HRD staff within the colleges expressed high expectations regarding a more proactive attitude and stronger leadership of the senior teachers within the group dynamics of the teams.

Contribution to school development. Both senior teachers and supervisors recognized that during the Master's programme, a wide variety of concrete outcomes were achieved that contributed to school development, both with respect to the work practice and leadership practice within and across teams.

Impact on the work practice is reflected in the new curricula that have been developed, sometimes in close cooperation with the work field.

Teams have adopted new didactic approaches, used new tools that make teachers aware of their impact on students, developed new strategies to fight early exit from school and used new mentoring approaches, among other activities. Two senior teachers reported that these changes have also resulted in promoting ownership, self-awareness and a proactive study attitude among their students.

> I realize that the things that I learn, that pro-active attitude, that I share that with my students, that I try to make them aware of how they learn and what they learn. Through this, in one of the groups, half of them decided to accelerate their learning. They realized that they could organize their own curriculum, and they graduated half a year earlier. By making the things that I consider important more explicit [...] they learned that they themselves can influence circumstances to a large extent. (Senior teacher 1, School 1)

Senior teachers, supervisors and HRD staff also reported the impact of the leadership performance of the senior teachers on *leadership practice* within the school, as reflected in the growing self-awareness of the teams. Inspired by the leadership of the senior teacher, several teams initiated the innovation of curricula and teaching, became more able to solve problems, and developed a positive flow and a stronger focus on team learning. These teams felt better equipped to discuss their needs and ideas with managers, and they developed a greater openness to research, data and theory, and a stronger focus on sharing knowledge.

> The head of our department is a facilitating leader. He wants to know: what do you need, what can I do for you? Many colleagues had problems with that. They wanted him to tell them what they should do. Through my study, I can now recognize this. Now I can say to my colleagues: Look, this is how he works. So we have to make our own plan: this and this is what we want, and this is what he has to do. This really has changed the way we work and cooperate. More and more, we now are working as a team. (Senior teacher 2, School 1)

Changes in the organizational structure and culture

Organizational characteristics are both conditions for the impact of Master's programmes on school development and the results of the boundary crossing activities that are stimulated by the design of the Master's programme and the leadership role that is assumed by senior teachers.

Organizational structures and cultures are not static, but rather can change because of boundary crossing activities and because of leadership initiatives by senior teachers. In their responses, both senior teachers and supervisors highlighted issues with respect to internal boundaries; the role of self-steering teams; the contribution of senior teachers to the wider strategic aims of the school; expectations with respect to the organizational level where the leadership of the senior teachers would have impact; and pressures with respect to accountability measures and financial limitations.

The three schools are large institutions that are characterized by *internal boundaries* between departments, between teaching staff and administrative staff, and between teachers and management. These boundaries

had created a situation in which teachers felt dependent on the decisions made by management, where a curriculum innovation unit had taken the curriculum responsibilities from teachers, and where a culture of complaint could blossom. The senior teachers themselves contributed to the reduction of boundaries by stimulating exchange between different departments, by stimulating dialogue between teachers and administrative staff, and by mediating between teachers and management. In School 3, the senior teachers initiated a regular exchange with the staff unit for curriculum development to share and strengthen the curriculum development processes.

Within the three schools, the respondents realized that strengthening the teachers' voice and role in curriculum development requires a change in culture from a hierarchical organization to *self-steering teams*. Within School 2, the organizational structure was already based on self-steering teams, whereas within the other two schools, initial steps in this direction have been taken. The senior teachers are expected to strengthen the ability of these self-steering teams to assume responsibility and accountability for organizing their work and developing their teaching. The combination of appointing senior teachers and engaging them in the Master's programme is considered to be a catalyst in this process toward self-steering teams.

> I believe that next to the bureaucratic aspects of this organization, I can contribute to a culture where team members can base their work on a stronger sense of self-awareness of their own qualities and expertise instead of on a docile attitude, thinking that they have no choice. But, we are not there yet. (Senior teacher 1, School 1)

This focus on self-steering teams suggests that teams could define their priorities bottom-up. This possibility appeared to contrast with the overall ambition that senior teachers contribute to the *wider strategic aims of the school*. This overall ambition was reflected in the responses of most supervisors and senior teachers, which indicated that, after graduation, the supervisors would provide assignments or projects that the senior teacher could or should assume. In School 3, for example, the senior teachers were expected to assume the lead in implementing a new school-wide vision and educational model.

> As a centralized organization, we will always look for some kind of assignments. It has been suggested that senior teachers or their teams should come up with their own suggestions for projects, but I don't think that is the best idea. I think that managers, the central administrative departments and the school board should take the lead in this. (Supervisor of senior teacher 4, School 2)

This sentiment contrasted with the activities that the senior teachers initiated during their Master's programme, which were not instigated from above but rather were based on their personal and professional observations of quality issues within the daily practice of their teams, of external developments and of the needs of their colleagues.

Although the senior teachers were not considered to be a collective factor within the school, School 3 had high expectations for the individual

contribution of the senior teachers to the *school as a whole*. The expectation of the management of this school was that the research projects that the senior teachers conducted as part of their Master's programme would have a potential impact on the entire school. In three cases, steps had already been taken to implement the outcomes in other teams or departments or even school wide.

> His research study focused on the inter-relation between teachers and students. This led to a very positive response within his team. Colleagues considered the tool he developed as very useful to reflect on their relations with students and to discuss this with them. Now, we want to extend it to other teams in small pilots. He will lead these pilots. Eventually, all teams within our school will work in this way. (Supervisor of senior teacher 8, School 3)

The *pressure* in the schools brought by financial limitations and accountability measures from the government created a context within the schools where there was little time for teacher meetings, collegial discussions and reflection. Several senior teachers indicated that they struggled with the organizational focus on control measures, which left little room for a culture based on trust. Because teachers and managers were held accountable, there was a tendency toward justification and window dressing. The senior teachers tried to create a counter balance by addressing this tension, by stimulating exchange and discussions among teachers on teaching and learning, by focusing on team development through coaching and peer review, and by stimulating research and inquiry.

Most of these issues reflect an ongoing dialogue on organizational conditions and on the precise roles of senior teachers within schools. This dialogue has been encouraged through the various boundary crossing activities involving senior teachers, supervisors and university teachers. The senior teachers played a key role in changing organizational conditions through initiatives that connected different levels within the school, crossing internal boundaries. Through collaboration as a group, they tried to strengthen their impact on the level of the school as a whole, stimulating a culture that focused less on control and more on development and trust. Collectively, these teachers tried to manage expectations with respect to their roles; they developed a concrete profile of senior teachers in the final phase of their study that indicated what colleagues, supervisors and the school board should expect from them.

Discussion

Limitations of this study

The use of interviews as the primary source for data gathering created opportunities for a detailed understanding of the respondents' perceptions of the leadership capabilities developed by the senior teachers, their impact in the schools, and how the Master's programme and boundary activities between school and university contributed to this impact. At the same time, the process created limitations, as only eight participants and their supervisors were interviewed. In addition, the use of self-reporting

activities as the primary source of data gathering may limit the reliability of the findings. Through triangulation by interviewing senior teachers, their supervisors and their university teachers, we tried to increase the reliability of our findings. Furthermore, the combination of interviews with the HRD staff and university teachers and the focus group interviews at each school provided an opportunity to construct a complete picture for each school.

Finally, the design of the study was such that the Master's programme and the associated boundary crossing activities were studied as an isolated intervention within the schools. Within the dynamic contexts of schools, a wide variety of impulses and interventions contributed to changes in work and leadership practices. However, the contribution of these other impulses and interventions to the work and leadership practices in the schools could only be covered in a limited way because they were not systematically explored during the interviews.

As our research questions focused on boundary crossing activities between the university and the schools during the Master's programme, data gathering took place during the end phase of the Master's programme. As a consequence, this study could not provide information on the sustainability of the leadership roles of the senior teachers and their long-term impact. Although school management emphasized that the senior teachers would be expected to assume their role only after graduating from the Master's programme, the data showed that already during the two-year programme, the senior teachers developed new roles and new attitudes toward their work, in most cases leading to clearly defined outcomes at both the work practice and the leadership practice levels.

As a result, notwithstanding the limitations of the data gathering process, the study provided insights into how a Master's programme focusing on teacher leadership did contribute to individual leadership development and support school development by strengthening boundary crossing between school and university.

The impact of the Master's programme

From our findings, we can conclude that a Master's programme can contribute to changes, both at the individual professional level, as at the school level. On an individual professional level, the programme initiated a change in expertise, attitude, authority, self-awareness and sense of self-efficacy. Senior teachers participating in the Master's programme indicated that they had developed new perspectives on their role and position and new qualities that could be used in their daily work routines. Although the formal tasks and job characteristics of the senior teachers had not yet been substantially redesigned, they used their new perspectives and new qualities to perform their regular tasks with a different focus. In their tasks, they used a deeper understanding of teaching and learning, a stronger sense of organizational processes, a stronger focus on colleagues and a different, more inquiring attitude. Colleagues, supervisors and the strategic management of their schools recognized

these qualities and granted the senior teachers greater authority within the school. Through their leadership, the senior teachers initiated changes at the school level: they initiated improvements in the content and methods of the curriculum; applied research to elaborate on challenges such as early school leaving, student mentoring, workplace guidance and student assessment; and initiated interventions for improvement in those areas. Several teachers supported their colleagues, tried to strengthen the self-awareness of teams, stimulated a more analytical approach in schools, and acted as counterparts and sparring partners for the heads of departments. By creating new leadership practices with a focus on team learning and self-steering teams, they contributed to a culture of trust and clarified the potential role for teacher leadership.

Our study suggests an adaptation to the model of Mayrowetz et al. (2007), as the redesigned work was not so much a condition for leadership performance as it was a result of leadership performance. This adaptation recognizes the ability of teachers who developed their leadership skills to actively redesign and reinterpret their work themselves.

Boundary crossing and the quality of boundary objects

The assumption of the designers of the Master's programme was that creating several opportunities for boundary crossing between university and school would increase the impact of the Master's programme on school development. However, the interviews showed that these opportunities for boundary crossing are limited and still can be improved to become more effective.

One of the effective elements in the design of the Master's programme was to create boundary crossing activities during the design process of the Master's programme, stimulating strategic alignment and shared ownership. The ambition of the three participating schools was to combine the opportunity to appoint senior teachers with a Master's programme, connecting professional development with school development and connecting teacher leadership with innovation (Frost, 2012). The resulting *strategic alignment* between the strategic agenda of the schools and the aims of the Master's programme was reflected in the similar expectations that were expressed by the senior teachers, supervisors, management and university teachers with respect to the roles of the senior teachers. In addition to the activities within the Master's programme, the HRD staff of the schools organized activities to position the senior teachers within their schools, thus strengthening the impact of the Master's programme. In all three schools, the change of roles fit within a wider strategy to promote self-steering teams of teachers and to deliberately involve teachers in the redesign of curricula and teaching.

This strategic alignment was reinforced by the *shared ownership* that was created through the involvement of the HRD staff in the design of the programme and in the regular meetings of the monitoring group with representatives of the senior teachers, the management of the schools and the university staff. This shared ownership built a platform from which to

discuss issues and to suggest adaptations to the programme. However, this ownership did not extend to all of the senior teachers' supervisors. Most of the supervisors felt that they had no role in the design of the Master's programme for their senior teachers. As a result, there was a limited sense of external curriculum consistency (Kessels & Plomp, 1999). This gap between perceptions of the strategic management of the schools that initiated the Master's programme and the supervisors collaborating with the senior teachers within their department indicates that boundary crossing activities need to address not only the boundaries between university and school but also the boundaries within schools like those between strategic management and the departmental level.

The *collectiveness of the design*, involving 42 senior teachers from three colleges for vocational education as boundary crossers, and the connection of the senior teacher position to the organizational structure of the school contributed strongly to a shared awareness of the role of the senior teachers at all levels. The group of senior teachers developed strong collective self-awareness of their role and potential contribution to the school. At the same time, the strategic management, administrative units, heads of departments and teachers could not ignore the existence of a new group of teacher leaders within the schools.

The programme design was less effective in creating *boundary crossing activities of university teachers and school supervisors during the programme*. During the programme, these boundary crossing activities remained the exclusive task for the participants in the Masters' programme. This can be explained by the lack of effective boundary objects. Boundary objects can act as an interface for shared discourse through which differences between contexts are explored, knowledge is transformed and collective learning can be achieved (Carlile, 2004). In the monitoring group and the research projects, this type of discourse was established, creating an effective boundary object that provided '*a shared syntax which allows exploration of semantic differences*' (Macpherson, Jones, & Oakes, 2006, p. 7) between school and university. However, effective and meaningful boundary objects supporting the dialogue between university teachers and supervisors in the schools were missing. As a result, the actual involvement of supervisors in boundary crossing was limited, and the involvement of university teachers in boundary crossing was non-existent.

During the interviews, several suggestions were made to create a 'third space' (Stein & Coburn, 2005) in which participants, supervisors and university teachers could meet to work on challenging and tough problems from the schools. Such third spaces could develop into effective boundary objects that engage supervisors and university teachers in a shared discourse.

Conclusion

In this study, we examined the development and impact of teacher leadership within schools, and how this process could be supported by a Master's programme and by boundary crossing activities between schools

and universities. The study shows that boundary crossing activities can help to connect individual professional development and school development, and thus bridge the gap between university and school that exists in many traditional academic Master's programmes.

By using the concept of boundary crossing (Akkerman & Bakker, 2011; Star, 1989) combined with the concept of external curriculum consistency (Kessels & Plomp, 1999), six design elements were identified that could transform the Master's programme into a boundary zone connecting university and school (see Figure 1). Of these six design elements, three elements appeared to be decisive with respect to the increased impact of the programme:

(1) Strategic alignment: The alignment between the programme aims and the ambitions of the schools to improve their teaching in response to societal expectations was considered to be an important element for strengthening the impact of the programme. The appointment of senior teachers and their engagement in the Master's programme fitted neatly within a wider change agenda, and with the ambitions to strengthen the teachers' voice and role in curriculum development. The focus on teacher leadership was supported by an organizational structure with mandated senior teachers and by a focus on self-steering teams.
(2) Ownership: A shared understanding of school management and the university teams with respect to the aims and intended impact of the Master's programme, and the role of the senior teachers was created not only during the design process but also during the programme itself through shared involvement in monitoring progress.
(3) Collectivity: The engagement of a larger group of participants from a single school created, on the one hand, a critical mass in schools that cannot be ignored and, on the other hand, a context for mutual support and exchange among teacher leaders in schools.

The study also contributed to our understanding of boundaries and boundary crossing between schools and universities; we identified two factors that limited the impact of boundary crossing:

(1) Multiple boundaries: The study showed that not only the boundary between school and university need to be taken into account, but also the boundaries within schools, i.e. between teachers, teacher leaders, management and administrative staff. Our study showed that the shared ownership developed between the university teachers and strategic management did not extend to the supervisors, indicating that internal boundaries exist between strategic management and supervisors. When these boundaries are not addressed in the process of boundary crossing, and when supervisors or other administrative staff do not have the opportunity to develop ownership, the introduction of teacher leadership

may have little impact at the school level. Instead of expansive learning, a 'legitimate coexistence' between the new teacher leaders and hierarchic leaders may result (Akkerman & Bakker, 2011).

(2) The quality of boundary objects: The study showed that it was not sufficient to involve supervisors in guest lectures. If the ambition is to engage supervisors from the school or teachers from the university in the process of boundary crossing, it is necessary to define boundary objects that can act as an interface through which shared discourse can take place (Carlile, 2004), e.g. by creating third spaces where participants, university teachers and supervisors can work together, each contributing their specific expertise to solve tough problems in schools.

Our study also leads to reflections on the concept of teacher leadership. Within the schools that participated in this study, leadership was formally allocated. This type of leadership is connected to a specific position within the organizational structure based on a formal selection process, available positions and a higher salary. In this context, school management offers teacher leadership positions based on a formal mandate. In this way, teacher leadership is integrated formally and strategically into the structure of the school organization. This structure is different from a context in which teacher leadership is distributed and embedded in the culture of the school, and in which every teacher is given the opportunity to assume leadership based on the expertise needed in a specific situation (Spillane, 2006). These types of teacher leadership can be considered to be two discrete and fundamentally different forms of teacher leadership and two manifestations in a developmental process (MacBeath, 2009).

The formally mandated leadership of the senior teachers—defined by management and accompanied by a higher salary—appeared to fit within the existing hierarchical structures of the schools. Within the context of the three vocational colleges, this structure appears to strengthen the leadership positions of the senior teachers: the formal structures prevented the group of senior teachers from being ignored, because high expectations were created by management, supervisors, colleagues and the senior teachers themselves. The senior teachers were expected to demonstrate their fitness for the challenge and to prove their added value to the school. However, through these expectations, added value appears to be defined by the strategic goals of the organization and top management, and translated into assignments given by the management and supervisors to the senior teachers; these assignments aim to benefit the whole school and not just one team or a specific curriculum. In its extreme form, this structure might imply that senior teachers are mere strategic tools used by the school board to reach their aims. This approach hints at a reactive role for senior teachers and might indicate that the senior teachers are considered to be mere instruments for realizing the strategic aims of the school or department as a whole and to be extensions to management. This viewpoint appears to contrast with the concept of self-steering teams that define their own issues and priorities from the bottom-up based on local concerns instead of central strategic aims. However, in the context

of the three schools in this study, formally and strategically distributed leadership appears not to be just a distinct manifestation of teacher leadership but also a phase in the developmental process, as indicated by MacBeath (2009). In fact, several senior teachers used the newly acquired leadership role to reinforce self-awareness, autonomy and ownership of their teams and thereby contributed to a change of leadership practice toward more culturally embedded manifestations of teacher leadership.

In our study, the main focus was on the influence of boundary crossing on the school. However, boundary crossing implies a reciprocal process because expansive learning impacts both activity systems. We cannot draw conclusions regarding the impact of the boundary crossing activities on the university, as the data collection primarily focused on stakeholders in the school. The strategic alignment and collaboration between university teachers and the strategic management of the schools in designing and monitoring the programme indicate that there is an awareness within the university of the importance of adapting Master's programmes according to the needs of schools. However, the university teachers were reluctant to extend their role and to engage in activities within the schools. They understood their main task as supporting the senior teachers in such a way that the senior teachers would be able to engage supervisors and colleagues and to manage interventions independently within their local context. As a result, the university teachers had sparse information about the local context of the senior teachers and their performance in terms of leadership, implementation and inspiration. This lack of information suggests that the primary focus of the university teachers remained on the academic value of the programme for the individual participants. The practical impact on the school was a secondary concern, leaving the impact of the boundary crossing on the university relatively unexamined.

In a situation where mutual benefits of boundary crossing are expected, developing effective boundary objects that engage university teachers more intensively in boundary crossing activities and that stimulate expansive learning at the university level should be a topic for further research.

Disclosure statement

No potential conflict of interest was reported by the authors.

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