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Geijsel, F.P.; Krüger, M.L.; Sleegers, P.J.C.

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Data Feedback for School Improvement: The Role of Researchers and School Leaders

Femke P. Geijsel
Meta L. Krüger
Peter J. C. Sleegers
University of Amsterdam, The Netherlands

Abstract

The aim of this study is to better understand the role of researchers and school leaders in supporting school improvement through data feedback in the context of more responsive forms of accountability in the Netherlands. A process evaluation was conducted concerning the first three years of a collaborative project of a multi-management group of 18 primary schools and a group of researchers. The results show that implementing a system of data feedback starting from a shared vision on the need to learn from data, fostered processes in the school of learning from data for school improvement. The results also show a growing inquiry habit of mind amongst school principals, whereas the researchers learned how to take their role in the collaboration by providing conditions that enhance school improvement from data feedback. The results indicate that the collaborative process can be characterised by several learning functions and thus contribute to a better understanding of how *the conditions for data feedback and school improvement can be enhanced.*

Introduction

In the Netherlands, as in many other developed countries, calls for greater educational accountability as integral part of much broader school reform initiatives became insistent in the late 1980s and in the 1990s. Although these calls have been remarkably similar across many countries (Leithwood, Edge, & Jantzi, 1999), different strategies for increasing accountability have been developed, ranging from fostering competition among schools and implementing site-based management together with the increase of power for school governors to national assessment by the Dutch Educational Inspectorate . In many cases, these accountability strategies are the central vehicles for reform and are based on the assumption that holding schools accountable for attaining high standards will motivate schools to improve their quality.

The trend toward greater autonomy and decentralisation is a distinguished feature of these accountability initiatives. In the last 20 years, Dutch schools have been given greater freedom to create and implement their own policies, organise themselves and manage their own finances (Sleegers & Wesselingh, 1995). This not only results in more responsibility for schools to account for their actions to parents and students, but it also requires extra effort from the schools inspectorate to ensure that quality is maintained for all students. More recently, policy-makers and researchers have stressed the need for more responsive forms of accountability by using models that try to find a balance between self-evaluations and external evaluations of schools (Mulford, 2005). The concept of "earned autonomy" developed as part of the implementation of the Dutch Educational Supervision Act (i.e. a renewed framework for the Inspectorate) in 2003 is a good example of a more responsive accountability approach. Earned autonomy involves freedom to manoeuvre beyond prescribed accountability programmes and is meant for schools that have demonstrated that they are performing well according to the inspectorate's evidence and test results. Accordingly, the renewed inspectorate's framework demands from schools the capability of developing their own system of quality assurance through self-evaluation (Ehren, Leeuw, & Scheerens, 2005). The self-evaluation results of the schools should be valid and reliable and provide information about indicators included in the inspectorate's framework, such as results of student achievement tests, parents' satisfaction with the school, teachers' job satisfaction. If these requirements are met, schools will be confronted with fewer and less thorough inspectorate's visits. A valid self-evaluation is thus a necessary condition for schools to earn more autonomy.

In order to find a good balance between self-evaluation and external evaluation, a multi-school management group in the Netherlands with responsibility for 18 primary schools decided to set up a system of monitoring change processes in the schools with the aim to improve the education quality and earn more autonomy. Whereas the multi-school management group attached importance to a scientific basis of the monitoring system, a group of researchers (including this article's authors) from the University of Nijmegen and the University of Amsterdam was commissioned to collaborate on the development of such a monitoring system. The aim of the project was to implement a cycle of data gathering, data feedback and data use in all 18 schools that would contribute to both accountability purposes and school improvement efforts. In collaboration with the multi-school management group a survey was conducted in the schools providing monitoring data for the progression of school improvement in the 18 schools. Based on the survey, data feedback was provided to the school principals and their staff in order to inspire them to develop action strategies for school improvement in their specific schools. In another article (Geijsel, Sleegers, Stoel, & Krüger, 2009) the quantitative analyses of the survey data are reported. For the purpose of the present article we performed a process

evaluation in order to better understand the role and function of data feedback for school improvement in the context of quality assurance.

In this process evaluation, the development of the collaboration between school leaders and researchers throughout the project was an important point of attention. In the collaboration process efforts concerning the following three aspects of the process affected each other: school improvement from the perspective of multi-school management; school leaders' capacities to participate in a cycle of data gathering, feedback and use; and researchers' capacities to take the role of providing data for school improvement. The central question in our process evaluation is: how can researchers in collaboration with school leaders provide conditions, which support school improvement through data feedback?

Theoretical framework

School improvement

In his analysis of failures and successes of educational change in the past half century, Fullan (2007) argues that strategies are needed that have a "bias for action" by reconciling and combining top-down and bottom-up forces for change; a strategy which he calls "capacity building with a focus on results". International research findings, however, indicate that data feedback is not self-evidently used for capacity building for school improvement purposes (Earl & Fullan, 2003; Leithwood, Aitken, & Jantzi, 2001; Saunders, 2000; Van Petegem & Vanhoof, 2004). It appears that there is often a tension or a gap between the interests expressed in data and the actual use of data in the context of school improvement. Specific school leader capacities are needed to enable learning conversations based on data needed for data-based decision making (Earl & Katz, 2006). However, only schools that already possess change capacity seem to be able to handle the data and the feedback in a way that facilitates improvement (Visscher & Coe, 2003).

Although attention is drawn to school leaders' capacities and to conditions for educational researchers to enhance data use, educational literature has given only little attention to *how* the conditions for data feedback and school improvement can be improved and *how* the users can actually change their attitudes and methods. These 'how' questions concern questions about the type of actions and interventions that are important for organising and using data feedback in relation to school improvement and questions about how the data are received and understood by the users in schools. Questions like these received attention in research into the dynamics and design of organisational change and change management (Boonstra, 2004). Change processes are studied by using a distinction of different phases in the development of the change capacity of organisations (Boonstra & van der Vlist, 1996):

orientation, diagnosis, setting objectives, change and evaluation. Repeatedly going through these phases appears to give structure to the dialogue about change throughout the organisation. In the orientation and diagnosis phase, for example, interaction between management and employees is used to transfer visions and ideas, allowing problems concerning power relationships to be overcome before embarking on the objective-setting and change phases. In the change phase the importance of a combination of strategies and interventions at several levels in the organisation is emphasised.

The phases in the development of change *capacity* of organisations from Boonstra & van der Vlist (2004) specifically concern the change processes of an organisation, that is, the development of the learning organisation, and thus also concern the perspective of change *management*. These phases must be conceptually distinguished from the change perspective with a focus on unraveling the stages of change (see for instance, Ellsworth, 2000). In this article, this change management perspective is particularly suitable because our project includes the role of a multi-school management team in interaction with school leaders and researchers. Starting from this perspective, attention is now drawn to the role of school leaders and researchers as users and suppliers of data.

School leader capacities

To deal with school improvement in a data-rich world, school leaders have to develop a research minded way of working (Earl & Katz, 2002, 2006). They do not have to become researchers themselves, but they need to be able to read, understand and interpret data, to commission research, to give lead to the research processes in their schools, and to initiate dialogues in their schools in order to make sense of data together. Earl and Katz (2002, 2006) distinguish three capacities for leaders in the data-rich world:

1. *Develop an inquiry habit of mind.* Leaders will need to reserve judgment and have a tolerance for ambiguity, to value deep understanding and take a range of perspectives and systematically pose increasingly focused questions.

2. *Become data literate.* Leaders will need to be aware of needing different data for different purposes, to recognise sound and unsound data, to be knowledgeable about statistical and measurement concepts, to recognise other kinds of data (not only numbers, but also opinions, anecdotes, observations), to make interpretation paramount (instead of using data for quick fixes), and to pay attention to reporting to different audiences.

3. *Create a culture of inquiry.* Leaders will need to involve others in interpreting and engaging with the data, to stimulate an internal sense of

urgency (refocusing the agenda), to make time for data interpretation and for coming to collective meaning and commitment, and to use critical friends.

No matter how important these capacities are for school leaders in present data-rich societies, developing these capacities is yet another issue. A "mind shift" among school leaders is necessary. Many school leaders lack a clear view of how data feedback could be used for school improvement and they differ widely in their attitudes towards data (Earl & Fullan, 2003; Saunders, 2000). Saunders (2000) suggests that such differences are related to variable ability to determine the value of data: some trust data blindly, others are able to put the value of data into perspective. A combination of enthusiasm and the ability to put things into perspective seems to be the best option for working with data to facilitate school improvement. Thus, many users of data need to change their attitudes and methods of working to allow data to be used for school improvement purposes. Some argue that researchers as suppliers of data feedback could help school leaders to develop an inquiry habit of mind and become more data literate by making data more user friendly and more relevant for practitioners (see, for instance, Levin, 2004).

The role of the researcher

Based on interviews with school leaders, Van Petegem and Vanhoof (2004) suggest that data feedback can lead to better use of data when:

- the information is perceived as relevant by the users in the schools;
- users can interpret the information correctly;
- users subscribe to the method of comparison;
- users have the know-how to use the information;
- users can work on school development in a non-threatening context; and
- the data that is gathered lend themselves to providing feedback.

The implications of these conditions for researchers are that they will have to design the feedback differently than they are used to. They have to become more practitioner-oriented: take their questions and problems as a starting point for their research and provide feedback that school leaders and teachers perceive as useful and relevant for their own educational practice. This is not an easy job for researchers: it demands attitudes and methods of researchers, which do not belong to their core expertise and do not fit with their scientific targets and interest. Following the change management perspective, researchers could even become involved in providing interventions in

schools. Bennebroek Gravenhorst's study (2002) itemised the efforts of those who provided feedback on the results of questionnaires and those who used the data resulting from the feedback. Working together with the management, the researchers provided data as well as interventions that supported learning processes in the school. In this process, connections were made with other interventions going on in the organisation, improvements were proposed as part of the work plans and the realisation of these improvements was evaluated.

In this article, the focus is on the interaction of school leaders' capacities and the role of researchers during a project that intends to develop a cycle of data gathering, feedback and use concerning school improvement processes. Starting from a change management perspective, we will evaluate this process to better understand how researchers in collaboration with school leaders can provide conditions that support school improvement through data feedback.

Method

The process evaluation that we report in this article concerns the first three years of a project that took place in The Netherlands with 18 elementary schools that are part of an educational organisation called ROSA. The schools are located in a city in the East of the Netherlands and have a diverse pupil population and a diverse school identity. Each school is led by a school principal. In addition, the school board of the ROSA schools assigned a multi-school management team (general director and educational director) with a secretary and staff members for financial and personnel issues and maintenance.

The purpose of the ROSA project was building a cycle of data gathering, data feedback and data use, which was meant to support school improvement processes. For this purpose a survey was submitted yearly among the teachers and principals from the 18 schools (all three years N≥ ≥360; see Geijsel, 2001; Geijsel, et al., 2009). In this way the survey data served as a monitor for the progression of school improvement. The survey was meant to provide relevant feedback for fostering the development of action strategies for school improvement by school principals and their staff.

During the ROSA project we as researchers noted our own and the principals' activities, we wrote memo's and took notes during conversations and meetings and we also conducted additional interviews with significant others. These qualitative data are used for the process evaluation that is described in this article. The evaluation method that we used for this qualitative study is based on the theory described above and summarised in Table 1. We retrospectively made a distinction between the phases of

orientation, diagnosis, setting objectives, change and evaluation (Boonstra & van der Vlist, 1996) and explored the capacities of school leaders during these phases as set out by Earl and Katz (2006). We evaluated the role of researchers making use of the theory of Van Petegem and Vanhoof (2004).

Phases of The Organizational Change Process	Capacities of School Principals as Data Users	Researchers Providing Conditions
Orientation Diagnosis Setting objectives Organizational change Evaluation	Inquiry habit of mind Data literacy Creating a culture of inquiry	The information must be perceived as relevant by the users in the schools Users can interpret the information correctly Users subscribe to the method of comparison Users have the know-how to use the information Users can work on school development in a non-threatening context The data lend themselves to providing feedback

Table 1: Data Feedback for School Improvement

Results

Orientation

In the first period of the collaboration, a project group (researchers, general and educational director) was set up and it was planned that the project would provide for at least five years of data gathering, feedback and use. A great deal of time was then spent by the project group members on bringing about good liaison between the researchers by explaining the history and culture of the foundation and in building trust between all people involved in the process. According to the project group, the data that were already available (pupil monitoring system, reports of the Inspectorate, school report cards) seemed to offer insufficient opportunities for capacity building in the schools. Therefore, additional data were to be collected, focusing on aspects of the schools' change capacities.

Diagnosis

The group of researchers[1] in collaboration with the multi-school management team strived at implementing the cycle of data gathering and data feedback based on the survey (see method section) that would enhance data use by the principals and the teaching staff during school improvement processes. The following annual cycle of activities was planned: introduction of the survey at a management consultation meeting; data gathering; data analysis and written feedback; presentation of overall results during the annual collective meetings where the multi-school management

team and all principals discussed policy issues and future plans; and bilateral meetings between the educational director and the 18 principals.

A formal meeting with the principals, in which the collaboration plans and the initial survey were introduced, was followed by several more informal discussions of the educational director with the principals. In these discussions the following reactions came to the fore:

- Some principals did not see how inquiry could help a school at all; based on earlier experience, they considered results of inquiry not sufficiently concrete to be taken into practice;
- Some principals seemed to be somewhat anxious since the survey partly concerned an evaluation of school leader practices; one principal told the director that he would only agree if he could approve the questions on leadership before the survey would be submitted;
- Some principals expressed their concerns regarding this initiative of the multi-school management team to systematically link quality assurance and school improvement; they thought of this as an undesirable control mechanism and a threat to their autonomy;
- Some principals were rather neutral in their attitudes in a sense that they were open to learning from the data but could not yet see how;
- Some principals were quite enthusiastic and curious about where this would lead to; these principals wanted to learn about themselves being a leader and wanted to learn as a school team for better functioning.

In a retrospective interview later in the project, a principal told us:

> There was only little information at the beginning. It was absolutely unclear what was coming ahead of us and what it would mean. My concerns were about what efforts were going to be asked of the team members in my school, whether they would cooperate and also how I would be pictured in the study results.

In the project group, a discussion was held about how to address those doubts. As researchers, we made clear that we could not take all doubts away since for us it was also a new experience. At the same time, we noticed that for some principals their doubts were overruled by their trust and curiosity. We then decided to simply move on with the first survey, but also to invest in trust building at the level of the principals.

During the first round of the survey feedback the written feedback followed a set structure: introduction, brief description of the background for each section, and results

on three dimensions of transformational leadership, teacher collaboration, teacher participation in decision making, teachers' personal goals and efficacy, and three types of professional learning activities (scores for each school and scores for all schools, to allow comparison, with short explanatory notes). Within two months the written feedback reports were sent directly to the principals. In the bilateral consultations on the data, the principals could then decide to allow the multi-school management team to read their school reports. The principals expressed their appreciation of this procedure during the bilateral conversations with the educational director, and the process assisted principals to take some control over the data.

The feedback was accompanied by a statement inviting the principals to contact the researchers if they had any questions. In the first survey round, three schools requested additional information by email. No questions regarding data interpretation were asked. In the bilateral meetings, however, there were some comments of the principals about the poor introduction of the survey to the teachers. Another comment concerned the pure focus on leadership and team issues; school principals felt that they had to connect the findings to issues at the pupil level in their schools and found this difficult.

Setting objectives

As a result of the survey during the diagnosing phase, the multi-school management team and the principals came to discuss the purposes of quality assurance more thoroughly. The principals started to ask why and how questions about the directions that the multi-school management had chosen, including the collaboration with the researchers. In this process, it became clear to the multi-school management that they had to deal with the fact that the school principals differed quite widely in their opinions and attitudes. As a consequence, the management reconsidered and deepened their vision and started to explicate and express their intentions more clearly to the principals. The multi-school management team considered it important that principals started school improvement processes in their schools. The collaboration between researchers and principals could be an incentive for the principals to make this start.

Change

Now that objectives were put forward clearly and the first feedback cycle moved on, the project group stimulated all principals to discuss issues with their teams in order to plan for improvement and capacity building as part of their school's ongoing quality assurance and to prepare for impending inspectors' visits. Moreover, the project group consistently emphasised that the intentions of the data feedback were oriented at learning together and not on controlling principals. In both the feedback reports and all conversations concerning the data, the project group made clear that in their opinion the value of data only becomes clear in meaningful dialogue. The project

group attached more importance to this dialogue than to the exact score on the conditions. Also, the principals were given the freedom to distill aspects of the data feedback that they felt to be relevant to their schools to create ownership and to develop a positive attitude towards data.

For the second survey round, some elements were adjusted in response to the wishes of the principals. A pupil survey was added, concerning the extent to which pupils identified with and participated in the school as a learning and social environment. The aim of the pupil survey was to give a better idea of how the findings on conditions for school improvement related to other data sources (pupil data, school report cards). Furthermore, an explanatory letter was sent to the teaching staff and information was also sent to parents.

Although the purpose of the ROSA project was to implement a data feedback cycle which would foster change capacity in schools, the scores of the schools in the second survey surprisingly dropped instead of climbed. In the project group, we wondered whether the first effect of the feedback cycle was that teachers took a more realistic view of their schools' change capacities and felt confident enough to express their vulnerability.

Again, results were fed back by written school reports and again, no requests were made of the researchers for further explanations. In informal communication, however it nevertheless emerged that the principals had difficulty understanding the reports. Some even expressed the need for a guide that would help them to interpret the data in the context of the school. Although they had become more interested in the data and wanted to understand it better, they still found it very difficult to interpret the data and make sense of it.

Different interventions were made, such as collective meetings, workshops, bilateral meetings, to promote dialogues between school leaders about the data. The principals reflected on these interventions as being useful. Some did not discuss the data itself at all but just exchanged dilemma's that were apparent in their schools' processes. Others came to surprising insights regarding the relevancy of the data. One principal, for example, expressed his discovery in these words: "So the intention is that this becomes an instrument for ourselves. In other words, they are actually our data!" Through the interventions, more and more principals started to understand that the scores were not being used to judge the schools but to initiate processes. They now also felt that they could trust the researchers. In one school, where the principal did not want to take part earlier in the process, the principal now started to discuss the data feedback of the second survey round actively with his team.

Evaluation

To find out what the principals felt they had learned from the survey, an additional evaluation questionnaire was sent to the 18 schools by email. Only ten principals responded; the others later mentioned lack of time as a reason for not responding. Seven reported that the survey reports had stimulated their thinking and they expected this would lead to action over time; three said that the reports had already led to concrete action. Nine principals found that the discussions on the policy days and in the subsequent bilateral meetings contributed essential added value to the reports. In a later interview, one principal commented:

> In my school, we did not sufficiently consider the survey process at first. With whom and why should we discuss the results? The feedback to the team took far too much time. But now, we know how to plan the process and we also discuss that with each other. We can feel more calmness coming in the team. We keep reinforcing that it is something "from us to us". It is less threatening now. The survey has also become refined and better adjusted to our needs and practices. So, this project has put forward impulses for self-evaluation and more coherence of developments in our school. We now succeed in committing the whole school team to issues of quality assurance. Something we couldn't imagine three years ago. There has grown another culture of thinking about school improvement, another perspective on numbers that tell something about the school. We are also more able to interpret such numbers. Less tension, more internal motivation, a more natural approach. Our own responsibility has become clearer to us.

The multi-school management team also recognised improvements. According to the educational director:

> At the start of the project, most principals reacted from the perspective of settling accounts instead of learning. Only two or three still think that way. The rest is increasingly experiencing that they are in the cockpit with all kinds of measures and among them the projects' data feedback. What we want to achieve is that the principals start to see the organic whole.

When reflecting on what has contributed most to these profits, the management refers to the bilateral and group conversations. As stated by the general director:

> The most successful moments are those in which school principals, multi-school management and researchers come together. One has to take case in timing these moments strategically, but then these moments appear extremely valuable.

The general director also said:

> My colleague [educational director] keeps pressing the principals: he plans the meetings and asks questions of the principals about issues concerning the survey and its consequences for school improvement processes. In doing so, we notice that more principals start to make their own analyses upon a school data feedback report in advance of a bilateral meeting. But there are still also principals that do not take their own questions as the starting point. These principals hold another view on learning, which in most cases can be noticed throughout the whole school. Often these are the principals that are purely focused on the primary process of teaching and not on the coaching of teachers as adults.

In addition, the general and educational director had hoped that principals and schools would collaborate more during the process. This goal has not been reached so far. The educational director commented:

> The openness among the school principals has grown definitely. We now make a start with intervention. But eventually we want to work with core teams of principals discussing their schools based on available expertise and data. Such collaboration among schools is difficult to start and continue, however. The daily trouble interferes with finding a good rhythm.

Discussion

To better understand the role and function of data feedback for school improvement in the context of quality assurance, we presented a process evaluation of our researchers' collaboration with a multi-school management team and school principals intended to implement a system of data feedback for school improvement purposes. In our collaboration process, efforts concerning the following three aspects of the process affected each other: school improvement from the perspective of multi-school management, school leaders' capacities to participate in a cycle of data feedback and researchers' capacities to take the role of providing data for school improvement. The question that we asked ourselves at the outset was: how can researchers in collaboration with school leaders provide conditions, which support school improvement through data-feedback? Starting from a change management perspective (Boonstra, 2004), we described the activities that took place during the first cycle of phases of orientation, diagnosis, setting objectives, organisational change and evaluation. Using the conditions for data feedback fostering school improvement as put forward by Van Petegem and Vanhoof (2004) and the framework of Earl and Katz (2002, 2006) referring to an inquiry habit of mind, data literacy and a culture of inquiry, our process evaluation enabled us to relate the separate theories on phases in the

development of change capacity, school leader capacities and data feedback conditions of researchers (previously summarised in Table 1) and expand this with learning functions as part of a coherent model for the process of data feedback for school improvement. This expanded process model is presented in Table 2 and hereafter we will describe our corresponding conclusions.

School leader capacities

The reactions of the principals to the introduction of the ROSA project during the orientation and diagnosing phase made clear that there appeared to be a lack of inquiry habit of mind by many of them. The project group reacted by clarifying vision and purposes. During the change phase, the inquiry habit of mind of the principals improved, but then there appeared to be a lack of data literacy. The project group reacted by making adjustments and initiating dialogues. The principals felt supported by these interventions, became more interested in their school's data and started to identify their own data literacy as a problem. Meanwhile the multi-school management team invested in getting a better insight into what was going on by discussing issues with both the principals and the researchers. They became increasingly aware of what the ROSA project meant to the total organisation and where it would take them. So, from orientation to change, capacity building largely concerned the school principals and the multi-school management team. Finally, in the evaluation phase, it appeared that capacity building in most schools was not yet visible in terms of an efficient cycle of data feedback. But at the same time in some schools the first steps towards a culture of inquiry were taken. In this phase, it seemed to become clear how and to what extent capacity building seemed to spread throughout the schools.

The role of the researcher

During the orientation phase, the researchers' activities were mostly directed at getting to know each other and building trust at the management level, so that a non-threatening context for school improvement could be created. During the diagnosing phase, activities particularly concerned introducing the initiatives to the principals and providing data. In the phase of setting objectives, it became important that the users perceived the data as relevant for their schools. Hence, it was felt necessary for the multi-school management team to legitimise their planning by explicating their vision. The researchers participated in the many discussions within the project group to refine and explicate the vision of the project. In the change phase, user interpretation and user know-how became more important. Activities concerned stimulating and starting up the dialogue in schools regarding the school data feedback reports. Also a second survey and feedback cycle was conducted. The researchers adjusted the survey and feedback to the needs of the principals. They also cooperated closely with the multi-school management team in developing a method for principals for working with the data to discuss their schools' results and processes. In the evaluation phase the researchers joined the project group

Phases of Change Process	Capacities of School Principals as Data Users	Researchers Providing Conditions	Learning Functions Resulting From The Process Evaluation
Orientation	Problem statement	Building non-threatening context	Building trust Planning together which data are available and necessary in the light of the desired school improvement
Diagnosis	Diagnosis of inquiry habit of mind	Providing data that lend themselves to providing feedback Making sure that the users subscribe to the method of comparison	Creating a joint focus on discovering the relevance of data How to cope with doubts and resistance? Ongoing investment in trust building and creating ownership of data. Making the contents of the feedback clear for principals
Setting objectives	Development of inquiry habit of mind	Making sure that the information is perceive as relevant by the users in the schools	Creating a joint focus for school improvement by strengthening leadership in the school Discussing the purposes of the research; clearing the focus for all principals. General management deepens its vision and explicates and discusses its intentions with all principals; distributing leadership. Start learning from each other instead of controlling principals. Suggestions for improvement based on the data
Organizational change	Diagnosis and development of data literacy	Making sure that the users can interpret the information correctly and have the know-how to use the information	Creating ownership through contextual adaptation and designing supportive interventions Focussing on the dialogue with the aim of learning together; interventions to stimulate the dialogue between the principals and between each principal and his or her team in order to plan for improvement and capacity building. Creating support for principals to enable them to interpret the data Principals and teams select data that are relevant for their situation: adapting the survey questions according to the principals' wishes relating data about school conditions to data on pupil level
Evaluation	Spreading of culture of inquiry in schools	Establishing capacity building and moving to new problem statement	Creating a common focus on collective inquiry Sending evaluation questions to principals; taking decisions about the next survey round on the basis of the evaluation results

Table 2: Data Feedback for School Improvement Revisited

by gathering and discussing evaluative data regarding the project's processes and taking a critical look at what had been achieved so far.

Learning functions

Our analysis made clear that this process of capacity building involves more than establishing the capacities of school leaders and what conditions should be met by researchers. Our analyses actually suggest that during the phases of the organisational change process, learning processes were started and intensified. These learning processes might actually be the clue to answering the question *how* conditions were created and capacity was build.

To frame these learning processes, we distinguish five learning functions characterising the ways in which the collaboration of the multi-school managers, principals and researchers functioned (see Table 2, column 4). The first learning function is *building trust*. On the basis of trust and confidence, participants started to get involved in *creating a joint focus on discovering the relevance of the data*. An essential aspect of this process is that the intention behind data feedback is repeatedly explained. These two learning functions can be considered relevant for developing an inquiry habit of mind. The third learning function is *creating a joint focus for school improvement by strengthening leadership in the school*. The purposes of the research are discussed; principals set goals for their own schools and start learning from each other. Once people's attention is triggered by the potential relevance of the data, data literacy among the principals is enhanced by the fourth learning functions that might be called *creating ownership through contextual adaptation by designing supportive interventions*. The principals get to better understand the meaning of the data in light of the ongoing processes in their own schools and start to stimulate the dialogue in their schools. Activities and strategies at cross-school level are initiated by the researchers and evaluated with the multi-school management team. Through the expanding of culture of inquiry, cross-school cooperation might lead to more situated learning in future. This opportunity for learning has not been explored sufficiently yet, as became clear in the evaluation phase, so *creating a common focus on collective inquiry* as a fifth learning function probably becomes a key function of the collaboration during the next round.

School improvement through data feedback revisited

Capacity building depends on the joint efforts of all participants as can be seen in the process evaluation here presented and as also becomes clear in the learning functions. So indeed the researchers in collaboration with the school leaders have been busy fulfilling conditions of data feedback fostering school improvement. In this process, researchers need to be both process- and practitioners-oriented. However, in our view researchers should not go as far as Bennebroek Gravenhorst (2002) suggest, namely

that researchers should also intervene in the school to actually implement the thoughts and changes that result from the data. Providing interventions would easily harm the objectivity of the researcher. Moreover, research and educational consultancy are quite different jobs and thus demand different schooling. This implies that researchers should get to know their boundaries and should learn when to ask for complementary support from other professionals in or outside the school. This has also certain implications for the multi-school management. Managers need to invest in long term strategies for capacity building and school improvement by providing for ongoing learning functions to inspire the thinking and acting of principals and school teams. This requires support of supervisors or consultants to foster processes of implementation of school improvement efforts. This also implies strategies of professionalising school leaders and teachers with regard to an inquiry habit of mind and data literacy. And finally, it means enabling school leaders to create cultures of inquiry in their schools.

By describing this process of collaboration between researchers and school leaders in terms of organisational change phases and discussing the learning functions of the collaborative process that took place, we hope to deepen the understanding of capacity building and school improvement based on data feedback and to create more opportunities for schools in their efforts to improving education practice by evidence-based learning conversations.

Endnotes

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