Knowledge transfer in school-to-school collaborations: the position of boundary objects and brokers

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Abstract

This article reports findings from a case study carried out in a Swedish municipality focusing on a school-to-school collaboration established to support implementation of a nation-wide curriculum. The aim was to study how ideas for improvements in this temporary organisation were transferred to the local schools. The findings presented are derived from audio-recordings (n = 13) and semi-structured interviews (n = 21). Community of practice theory and the concepts of boundary objects and brokering guided the analysis work. The results revealed that, generally, transfer was restricted to boundary objects with a closed character, meaning these objects should be distributed to and unpacked in the local schools without further dialogues and modifications. In addition, non-formal brokers had less capacity to extend and lead improvement processes in local schools. This approach also reduced the possibilities for principals and teachers in the local schools to benefit from more advanced learning discussions and understandings developed in the temporary organisation. The article shows that designers of improvement work must consider boundary objects with a more open-ended character, permitting an innovative interpretation and learning process. Finally, in this process the findings also reveal the importance of formal brokers underpinning a transfer process in which both participation and reification are considered.

Keywords: community of practice, design, curriculum implementation, educational change, temporary organisation

Introduction

School-to-school collaborations that involve teachers and leaders working aside their ordinary contexts have various intentions and objectives. Thus, there are several terms and concepts to describe these collaborations, such as networks (Muijs 2010), school-to-school cooperation (West 2010), federations of schools (Muijs et al. 2011), temporary-intermediary organisations (Jaquith and McLaughlin 2010) and temporary systems (Miles 1964). Despite this variety of concepts, the one important question managers of improvement work must consider is how to link the work process undertaken in a separate organisational unit or network with the work carried out in
the permanent school organisations. These challenges are the focus of this article, which describes an empirical case where the school-to-school collaboration contained a temporary system design.

Internationally, there has been increasing interest in networking and school-to-school collaboration in recent decades (e.g. Muijs 2010; Muijs et al. 2010). Previous findings also indicate that this approach to school improvement could constitute a valuable platform for professional development and change in schools (Chapman and Allen 2005; Datnow, Hubbard and Mehan 2002; Harris et al. 2006; Lieberman and Grolnick 1996; Muijs 2008). At the same time, Muijs et al. (2010) argued that important questions can still be raised as to whether networking is to be understood as a ‘panacea’ for school improvement, e.g. as the theoretical underpinning for school-to-school collaboration is limited. Importantly, Dalin (2005) also pointed out that prior knowledge established within the field of school development, about networks and knowledge transfer (e.g. Lake and Miles 1975; Runkel 1978), has seldom been applied to school improvement over recent years.

Previous studies have identified the challenges of knowledge transfer in a school context. Investigating the large-scale Bay Area School Reform Collaborative (BASRC) in San Francisco, Jaquith and McLaughlin (2010) found that the impact of the BASRC on Bay Area education was disappointing since it resulted in few changes in district systems. Discussing the “handoff” from this temporary organisation, Jaquith and McLaughlin concluded that, despite innovative intentions, the BASRC mainly worked as a special project rather than as a transformative force for education reform. In the Swedish context, Björn, Ekman Philips and Svensson (2002) studied a large network for improvement work named the Albatross project. Although participating teachers perceived the network as useful and stimulating on a personal level, major parts of the work that were carried out seemed to have been unnoticed by teachers in the local schools. Thus, one conclusion drawn by Björn, Ekman Philips and Svensson was that the network collaboration, in this case, had larger effects at an individual teacher level than at an organisational school level.

Diverse concepts have tried to capture these concerns. For example, the term organisational communication (e.g. Kreps 1990; McPhee and Zaug 2001; Miller 2009) has been applied to internal and external communication in organisations. Other concepts often applied to illustrate knowledge building and distribution processes in organisations are knowledge transfer (e.g. Argote and Ingram 2000; Peet 2012; Szulanski 2000) and knowledge management (e.g. Hanisch et al. 2009; Liebowitz 1999; Lindner and Wald 2011). A closely related perspective focusing on distribution issues is knowledge sharing (e.g. Boh 2007; Fernie et al. 2003; Soekijad and Andriessen 2003). In other management and business administration literature, these processes are linked to the term transition (e.g. Becket and Hyland 2011; Chreim, Williams and Coller 2012; Lundin and Söderholm 1995). Finally, the notion
of translation has been applied in studies using a lens of new institutionalism to illustrate how ideas and information ‘travel’ and are reinterpreted in and between organisations (e.g. Czarniawska and Jorges 1996; Lindberg and Czarniawska 2006; Whittle, Suhomlinova and Mueller 2010).

There are some interesting features of the literature that emerge from this brief summary. First, while communication processes in and between permanent organisations have been discussed in a comprehensive way, less detailed attention has been paid to transfer issues linked to organisations or networks that are a temporary or short-term feature. Second, the theoretical terms identified have mostly been applied in academic disciplines rather than the field of education. Third, the extant body of empirical studies indicates that a constructionist framework which builds on components of community of practice theory (CoP) (see Wenger 1998, 2009; Wenger, McDermott and Snyder 2002) could widen the current application of knowledge transfer, particularly in the education field. The focus of this paper is the application of the concepts of “boundary objects” and “brokering” to this constructionist framework, i.e. describing and analysing transfer processes in a school-to-school collaboration with a temporary system design.

In previous work, (Nordholm and Blossing 2014) studied the design intentions among local school authorities in one Swedish municipality of creating a school-to-school collaborative network (described further below). One important finding from the early phases of the project was that it remained quite unclear during the design work how skills and competencies were to be transferred to the local schools.

Consequently, using a framework built on components from CoP theory, this article draws attention to the connection between the school-to-school collaborative networks and the local schools in the municipality. More precisely, the aim is to study how improvement ideas and practices developed in the collaboration project were transferred to the local schools. The questions this article addresses are:

1. Which types of boundary objects and brokers were developed to carry out knowledge transfer between the collaborative network and the local schools, and how were these links combined?
2. What benefits and problems evolved from these links and what consequences for knowledge transfer did the established framework create?

The article has the following layout: first, there is a brief description of the background to this work, introducing the theoretical starting points. Then, the case and the analysis work are detailed. After that, directed by the concepts of boundary objects and brokering, the results are presented in two separate sections. Finally, there is a discussion and conclusions.
**Theoretical starting points**

Pioneering work on CoPs, notably by Lave and Wenger (1991) and Wenger (1998), has been further developed and today provides an influential perspective on the understanding of learning, in and between practices and organisations (e.g. Akkerman and Bakker 2011). Wenger, McDermott and Snyder (2002, 4) stated that CoPs are built up by “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise by interacting on an ongoing basis”. Outlining this social theory of learning, Wenger (1998) emphasised the concepts of negotiation of meaning, participation and reification. Wenger understood meaning-making processes in CoPs as a duality between participation and reification. While participation refers to a process that embraces both actions and connections in a CoP, reification are the abstractions, tools, symbols, stories and concepts that the on-going negotiation produces. Wenger (1998, 65) concluded that this “duality is a fundamental aspect of the constitution of communities of practice, of their evolution over time, of the relations among practices, of the identities of participants, and of the broader organisations in which communities of practice exist”.

This duality is central to understanding how CoPs are linked to each other. Thus, regarding boundary work, two particular types of connections are emphasised. First, Wenger (1998) argued that reifications in CoPs generate boundary objects such as artefacts, documents and tools (also see Star 2010; Star and Griesemer 1989). Boundary objects behave as a coordination function between CoPs, possessing the capacity to bridge between disjointed forms of participation. However, Wenger stressed the importance of not seeing these objects as self-contained as they, to a large extent, exclude the meaning-making processes that gave rise to them. Therefore, according to Wenger, boundary objects, such as artefacts, should be designed for participation than just for direct use.

Second, with a greater link to the dimension of participation, Wenger (1998) applied the concept of brokering. This task includes establishing new connections across CoPs that enable coordination and communication. In emphasising the difficulty of this position, Wenger described how it involves processes of translation, coordination and alignment between practices. Hence, Wenger (1998, 107) stated that “brokering provides a participative connection – not because reification is not involved, but because what brokers press into service to connect practices is their experience of multimembership and the possibilities for negotiation inherent in participation”. In a school setting, this brokering position might require opportunities and a legitimacy to impact and lead the development of work practices (cf. Fullan 2004; Leithwood et al. 2007).

Nevertheless, in reviewing the current body of literature criticism of the work of Wenger and colleagues must be taken into consideration. For instance, it has been argued that the CoP concept has evolved into quite a unhelpful and imprecise
umbrella term with several distinct components. Hence, theorists have advocated a more nuanced and differentiated understanding of the concept for analysing different types of practices (Amin and Roberts 2008). Regarding the concepts of boundary objects and brokering it can be noted that Wenger and colleagues have borrowed them from theorists rooted in different traditions (see for instance Eckert and McConnell-Ginet 1992; Star and Griesemer 1989). Further, since these conceptual elements of CoP have received less attention within the field of education and been rarely applied in empirical analysis their utility for capturing the process of knowledge transfer between temporary and permanent organisations has not been explored. However, beside the arguments presented in the Introduction, the main motive for continuing to apply Wenger’s framework generally, and the boundary objects and brokering concepts particularly, is linked to the type of transfer process addressed here. This encompasses not only the transfer of materials but also more context-bounded and embodied learning outcomes (as further discussed below). For this purpose, Wenger’s concepts seem more appropriate than other influential starting points for analysing educational practices and collaborative networks. For example, in contrast to cultural historical activity theory (e.g. Engeström 2001; Roth and Lee 2007), which has been portrayed as a strong and relatively tight theoretical framework (Nicolini 2012), the framework of Wenger and colleagues permits more open-ended analysis. In response to the criticisms highlighted above, it could likewise be argued that looser frameworks provide greater opportunities for inductive analysis of social processes and learning.

Introducing the case study

As Ragin and Becker (1992) highlighted, case studies can be understood as specific theoretical constructs, which coalesce in the course of the research. Likewise, Stake (2005) coined the term “instrumental case study” in which a particular case study is generally used to provide insight into a specific issue and to suggest possible generalisations. Accordingly, the function of the case study in this work was to offer empirical data able to demonstrate certain features of knowledge transfer within an educational setting.

The Swedish municipality studied here started a school-to-school collaboration to back-up the implementation process of the new curriculum and education act in the 2011–2012 academic year. This project, which was initiated and run from the central level of the municipality, was optional and it was never aimed at replacing a process in the local schools. The focus and function of the collaboration project was instead to generate supportive knowledge and material. Altogether, between 100–120 teachers in the municipality, representing all elementary school subjects, were involved in the collaboration created.
In the selection procedure, teachers in the local schools had the opportunity to express their interest in being part of this temporary project organisation. A small management group, operating at the central level of the municipality, made the final selection of participants. This central pedagogic development group (CPDG), involving central school developers, school district leaders and principals, was in charge of the improvement project based on a mandate received from a superintendent. The final selection of participants was based on a desire to gather skilled teachers and principals of schools catering for year 1–9 pupils who were willing to participate in the collaborative network, with a geographical spread covering as many schools and school districts as possible.

Hence, central subject groups (CSGs), made up of teachers from the entire municipality, were established. In these groups, placed below the CPDG in the temporary organisation, teachers worked together across schools led by the management group, i.e. the CPDG. Almost every group had principals as moderators. Meetings took place every one or two weeks during the first semester and lasted for approximately 90 minutes each. For the remaining months of this academic year, the groups met generally every two weeks. In the following academic year, 2012–2013, meetings occurred less regularly, as half-day events every six weeks.

Several elements of this context warrant further comment. Primarily, even if the CPDG and principals in the local school regarded selected teachers as having the expertise required to participate in the improvement project, this does not necessarily mean they were skilled brokers as other qualities may also be needed for effective brokering. In addition, teachers who were not involved in the municipal collaboration should not be regarded as less skilled than participating colleagues, for several reasons. For instance, some schools took a conscious decision not to participate in the project, and some teachers in those that did declined to participate. Further, the procedure did not include the education administration issuing distinct directives to principals, or directives from the CPDG regarding use of CSG teachers in the local schools. Finally, the principals did not have a defined role in the collaboration, apart from the limited number acting as moderators. Consequently, simply being (or not being) in the temporary project organisation does not imply a unifying boundary for knowledge transfer. Instead, within this network collaboration the transfer issues were also impinged by diverse factors including the brokering skills of participating teachers, their role and mandate in their everyday contexts, and the local school culture.

Regarding boundaries of the current case, it is important to highlight the established groups worked separately from the local school organisations. Recognising the work of Miles (1964), this model could be likened to a temporary system in which skilled teachers can interact and jointly accomplish specific improvement tasks (also see Nordholm and Blossing 2014). In contrast to other designs, where teachers and leaders might, for example, meet directly across schools, this set-up
comprised a middle-level organisation consisting of groups of teachers representing all the subjects taught in elementary schools in Sweden. An important point to note, associated with the theoretical departure point and the concepts of boundary objects and brokering, is that the collaborative network addressed here covers the temporary organisation established and the schools represented within it. Thus, local schools that lack members of the temporary organisation fall outside the focal case.

**Analysis of data**

Empirical data were generated from audio-recorded observations \((n = 13)\) and semi-structured interviews \((n = 21)\) completed during the 2011–2012 and 2012–2013 academic years. The sample was determined by the intention to trace transfer processes between the temporary project organisation and local schools participating in it. The study focused on physical education, social sciences and mathematics, partly to cover both practical school subjects and school subjects with different knowledge traditions. However, the choice of schools and teaching subjects was also guided by an objective to cover variations in schools’ characters and local conditions. Six meetings of the CSGs and seven meetings with subject groups at the local schools were initially observed to broaden understanding of the improvement project and identify key issues for further exploration. An essentially inductive approach was adopted during the observations, framed by a number of “foreshadowed questions” (Hammersley and Atkinson 2007). Field notes were also taken to follow up themes and questions. The next stages involved eight interviews with the superintendent and governing CPDG unit, ten with teachers participating in the CSGs, and three with focus groups consisting of subject groups at different schools in the municipality. In all interviews, representatives acting at different levels of the project were asked detailed questions of emerging importance to distinguish the transfer process. For instance, the superintendent and the CPDG were asked how they had planned for transfer and how they imagined that transfer to the local schools should occur, while teachers in the CSGs were asked about their understanding of the transfer process and their role as brokers. Finally, important questions that emerged to address in the focus group interviews were what (if any) aspects of their efforts influenced the everyday work of the local schools, whether the CSG teachers’ knowledge was capitalised, and if so. All interviews were digitally audio-recorded and transcribed verbatim, and all names used are pseudonyms.

The transcripts were organised and systematised with qualitative software (Atlas.ti 6.2). As suggested by Miles and Huberman (1994), this initial procedure aimed to recognise the overall patterns and thus increase reliability by identifying contradictions and outliers. Data were then classified in accordance with the two transfer concepts “boundary objects” and “brokering”. Guided by these two theoretical
categories, the analysis work was carried out in a more focused and inductive fashion in the next step. This second cycle of coding aimed to categorise data based on conceptual similarities (Saldana 2009). Thus, the established categories and sub-categories worked as indicators for different types/classes/usages of boundary objects and brokers for transfer, as well as for discussing how these were combined. The quotes selected in the results section are designed to represent these categories and sub-categories.

Regarding limitations, it is important to note that several distinctions were made in the analysis work. First and foremost, with this research design, issues of transfer became largely an empirical question connected to a particular improvement case. Linked to this, it also becomes important to emphasise there were numerous occasions for transfer to take place outside of the observations and interviews, i.e. through additional boundary objects and brokering. With respect to boundary objects and brokering, one should note that these analytical concepts, applied as ideal types are, in fact, empirically twinned. It is also important to stress that transfer in this article was isolated to just include quite linear processes from the collaborative project to the permanent organisations, i.e. the local schools.

To conclude, the results described below aim to identify different types of boundary objects and brokers, and how the links for transfer were combined. These results also aim to show the advantages and problems that emerged in using these boundary objects and forms for brokering, both separately and combined. As expected, the first questions are discussed more by respondents from the CPDG and the CSGs, while the latter question is of greater interest to respondents in the local schools. The two sections of results are, as stated, directed by the concepts of boundary objects and brokering. The overall findings are then discussed as applied to an integrated set-up. Finally, this leads to a number of conclusions.

Results

**Boundary objects as links for transfer**

The empirical analysis showed that boundary objects possessing different characteristics were developed as links for transfer between the collaborative project and the local schools. Initially, the respondents experienced certain objects as being more “closed”, meaning these objects could be distributed to, and used in, the local schools without further modifications. They were described as being quite standardised and, because of that, they were thought to ensure that schools in the municipality would receive the same directions and guidelines when implementing the new curriculum.

One of the main tasks for the CSGs, stated by the CPDG and often referred to by the respondents, was to process the new curriculum and syllabuses. This work, which was clearly defined in the start-up phase of the project, should have made use of common assessment matrices and templates that could be transferred to all
schools in the municipality to increase equality. The supportive products were to be distributed through two web-based communication programs that all schools in the municipality had access to. As the opportunities to send teachers to the CSGs were limited, these objects were seen as a strategy to compensate for the fact that only a selection of teachers and individual schools could participate in the work of the temporary project organisation.

One social sciences teacher explained:

Interviewer: Is there any way to get access to your material, so to speak, the material you have produced in the CGSs?
Sally: Yes, we have a net-forum where we are supposed to upload our memo notes ... And then in the next step, working with matrices and guidelines, we added them ... so it's available so one could look at it... Then you don't have to sit and reinvent the wheel by yourself and you can feel that it (the material produced) has spread.

The analysis also revealed a second type of boundary object that had a more 'open-ended' character. That is, aside from the standardising material such as matrices and templates for assessment, there were occasional attempts to develop and transfer more open-ended objects. In contrast to the first sub-category, respondents experienced these objects as less regulatory, mainly because they permitted or demanded an interpretation and negotiation process in the local schools, and were seen as materials to draw inspiration from, rather than to implement. Some examples of these objects were finding or shaping illustrative pupil examples, elaborating starting points for planning new areas of work for the pupils and web-based documents available for teachers through discussion threads. These objects were, however, less common.

One of the tasks for the CSGs that gained much attention in the middle part of the collaboration project was the provision and distribution of illustrative pupil examples used to generate further discussions in the local schools. Although the response to this idea within the CSGs was mixed, the physical education group were keen to follow it through. One leading idea was to develop film clips that could demonstrate criteria in the syllabuses and the matrices developed at local level in the municipality. The thought was that these films clips could constitute a base for discussions, both between teachers but also between teachers and pupils. By illustrating the content and the grading levels in the syllabuses, the films clips were intended to have a formative purpose in assessment. A physical education teacher, explaining the benefits of this approach, said:

Sarah: And we in the CSG representing physical education would like to use film because it’s difficult in written form. It becomes easier for pupils to see that this is exactly what we mean.

In short, the analysis detected boundary objects with a more closed character, meaning they were produced for direct use in the local schools. The analysis also
identified boundary objects with a more open-ended character which, to a larger extent, permitted or demanded participation and negotiation processes in the local schools. The latter type of objects was less common, but also less universally circulated since they were only produced in some of the subject groups. There was also a desire in the CSGs and the subject groups in the local schools to carry out improvements in the traditional way and by so doing transfer something ‘completed’ that could be directly put into practice.

The next step of the analysis was to study the benefits and problems these boundary objects generated when used as links for transfer. In respect to boundary objects with a closed character, one finding emphasised by both the CPDG and the CSGs was that giving the web-based communication programmes such a central position turned out to be more demanding than expected. This was mainly because the objects produced, such as matrices and templates, were hard to find for teachers and principals. Another difficulty shown in the analysis was that interest in the material produced varied greatly between teachers and schools. Still, it is important to underline that the objects often reached the local schools and were used by practising teachers.

However, when the objects were put into practice by teachers in the local schools, there were challenges following the CSGs’ instructions. This segment from one focus group interview with social sciences teachers illustrates this:

Patrick: Right now we have abandoned their matrices because they didn’t work and then they (the instructions guiding the pupils) take less space compared to what it was supposed to do I guess.
Interviewer: What with the matrices didn’t work?
Patrick: They embraced all targets (in the syllabuses) even though we don’t work with those at the moment ... then it just takes up space and confuses the pupils.
Mary: You were not able to modify them?
Patrick: Not the ones from the CSGs.

Concerning boundary objects with a more open-ended character, mismatches between functions in the web-based communication programmes and the transfer objectives became even more evident as the work continued. For example, this included problems with transferring more open-ended outcomes of the improvement work such as film clips demonstrating the criteria in the syllabuses and the locally-created templates. The main reason for this was that the software used and the functions in the web-based communication programmes did not match with the improvement ideas. Hampered by this issue and with no changes in links to local schools, a situation existed where these boundary objects largely remained within the temporary system.

To summarise, in this first section of the results, the analysis revealed that boundary objects with a closed character were produced for direct use in the local schools. Being a priority for the improvement work, these objects were available
through two web-based communication programmes that all schools in the municipality had access to. Yet, despite the objects reaching the local schools as planned, the analysis revealed that teachers had difficulties implementing the objects and putting them into practice. With respect to boundary objects possessing more open-ended characteristics, the analysis indicated that no clear links emerged, or were designed for, in the collaboration project. Put another way, these objects often stayed in the CSGs and were therefore spread to fewer teachers in the municipality.

Recognising the dominance of boundary objects with a closed character together with an inadequate framework, the function of brokering became important in this particular case. Theoretically, the individual broker, i.e. the CSG teachers, could still constitute a link between the collaborative project and the local school organisations, even if the boundary objects were problematic. This issue is therefore focused on in the next section of the results.

**Brokering as links for transfer**

This second section starts with some initial remarks. The limited number of teachers who participated in the CSGs restricted opportunities for the local schools outside the focal temporary organisation to use brokers with potential to link the different learning communities. In other words, this design reduced the number of opportunities to compensate for the fact that teachers in the local schools did not participate in the discussions of the CSGs that helped produce boundary objects with different characters.

The brokering function was often highlighted by the respondents and seen as important for transferring knowledge and outcomes between the collaborative project and the local schools. For instance, the superintendent in the central administration said:

> Christina: Actually they (the CSG teachers) are as I have shown in the model... they constitute the interface because they should drive the central administration towards general school improvement... they should be the carrier (of ideas) and at the same time participate and implement those ideas in their own work place. So they are extremely important people.

The analysis identified discussions about different types of brokers. In the early phases of the collaboration project, the CPDG wanted the CSG teachers to occupy a formal brokering position, in and between the local schools. However, this idea, that the CSG teachers should receive a formal improvement assignment operated by the education administration in the municipality, was never realised. One respondent in the CPDG argued:

> John: They never received the assignment to become communicators in their schools. We wanted that but one (political representatives) was not willing to do so because one thought that it was not negotiated. It was unfortunate... it would have been good if they had got that.
Even in the CSGs, there was some recognition that this might have reduced the potential for transferring the work carried out in the temporary organisation, e.g. the established boundary objects. For example, one physical education teacher requested a formal assignment on a municipality-wide basis for developing an expanded dialogue between the CSGs and teachers in the local schools:

Doris: There is a need for us to reach out to the schools so that physical education teachers in the municipality get together and then we could explain what we think so that you just don't distribute something. It's a bit like that ... things that you receive from above and you do not know where it comes from ... I think that some kind of dialogue would have been good instead ... so that we who are to use it (the matrices and templates) get a chance to talk to each other ... Otherwise, there is a risk the material will not be used.

It is important to note that teachers could still be given a formal mandate by their principals to act as brokers and lead improvement work. However, the analysis identified few examples where the work in the temporary project organisation was transferred to the local schools using such an approach, e.g. by a distributed leadership embracing a shared commitment to school improvement.

Consequently, the absence of 'formal brokers' linking the work in the temporary organisation to the local schools resulted in a situation where a second type of broker, the 'non-formal' type, became central. Through this, the brokering position in the collaborative project often depended on CSG teachers' ability to take on this position in the local schools. However, the respondents experienced and described how this framework caused problems. The CSG teachers had difficulties within the local school organisations transferring the dialogues and boundary objects from the CSG meetings. Further, the findings indicated there was uncertainty, both among principals and among the CSG teachers themselves, as to how to make use of the skills and knowledge attained:

Interviewer: How do they use you here (in the local school) then? The skills that you receive in the CSG, do they apply them in your school?
Terry: No, actually no.
Interviewer: Okay.
Terry: In fact, no and I wonder if we have talked so much about it. No, there is not anything that we have actually discussed.
Interviewer: Perhaps in the subject group your competency (is used)?
Terry: Yes, not so much there either.

The analysis also identified that some CSG teachers used their initiative in order to make use of the skills and knowledge acquired. In other words, they tried to transfer work processes to colleagues in their local schools, acting on informal mandates. Even though the CSG teachers in general could participate and contribute in the implementation of the new policy documents, findings showed that resistance
emerged when new ideas challenging features of the local school culture were introduced. This was illustrated by a CSG teacher, representing mathematics, in one focus group interview:

   Elisabeth: I do believe there has been a difficulty if you look at it... you come from a CSG that could be very inspiring and funny because we have great fun... and then you come to your colleagues and say 'you know what - we have looked into this' and they reply 'okay but here we obviously do it like this'. And just like that the discussion is already dead.
   Interviewer: Yes.
   Elisabeth: And then it feels both very rewarding and disappointing that I have the opportunity to improve myself but for the school development in my old work place nothing has happened.

Importantly, some examples were found where CSG teachers received formal support from principals to act as brokers and lead improvement processes. The analysis implied that when CSG teachers were given such a position, there were clear benefits. For instance, it became easier to transfer more context-bound knowledge. A principal, who apparently had thought about the differences in the municipality, declared:

   Joan: Then the CSG representatives have an assignment in their schools as well. In my school, we have three CSG representatives and they provide great support for me when we discuss our pedagogical development questions. The implementation of Lgr. 11 (the new curriculum) and so on, they sketch the whole calendar actually when it comes to the development organisation.
   Interviewer: Yes.
   Joan: But I’m not sure if that is the situation in all schools.

To summarise this section of the results, some overall patterns are worth highlighting. The analysis suggested that the role of brokers was generally overlooked, even though the respondents highlighted this position as important. The findings also showed the local schools did not have a clear structure of how to use the CSG teachers, and that non-formal brokers were struggling to gain acceptance and lead improvement processes. Finally, as demonstrated by one specific, atypical case, the analysis showed that formal brokers could unleash greater potential and thereby transfer more context-bound knowledge between learning communities.

Discussion
The concepts of boundary objects and brokering, and the duality between those two concepts, have received a central position in this article. Linking these theoretical concepts to empirical results broadens the current picture and (lack of) understanding of transfer between organisational units in schools. In the analysis, in which the two theoretical concepts were analysed inductively creating two sub-units, it also became clear that the concepts, separate or integrated, need to be carefully planned in order to work successfully.
Outlining these analysis units separately, boundary objects designed in a more closed way appeared to be the dominant link for transfer within the collaborative project. Overall, transferring directional objects through the web-based communication programmes generally worked, even if teachers had some difficulties in finding the objects and putting them into practice. However, the shortcomings of this link became more evident when boundary objects with a more open-ended character were to be transferred. Although these types of objects were less common, examples mostly from the physical education group showed there was a desire to develop and transfer these types of objects as well.

The dividing line between open and closed boundary objects could, however, be discussed and further problematised. Objects that some actors or local schools perceive as open could be perceived as closed to others, depending on their interpretations. In the conceptual framework of Wenger (1998), this divergence can be attributed to the impingement of both participation and reification processes in the receiving organisation on the interpretation of a boundary object. In analysis of this process, this article highlights the roles of brokers, local principals and to some extent local school authorities, but obviously other factors may also affect how boundary objects are perceived, elaborated, and used in practice. For instance, the local school culture may affect resistance or willingness to ‘open up’ and transform objects with a closed character into open ones. In this process, teachers with school improvement assignments such as ‘first teachers’ or development leaders could play key roles.

A major hindrance in the focal case was a lack of clear channels for transferring boundary objects (regardless of their character) to the local schools, which further increased the importance of effective brokering. As Wenger (1998) pointed out, the duality between boundary objects and brokering is central for linking learning communities together. However, acting as a broker without a formal mandate proved to be challenging if traditional ways of working were questioned. The analyses also showed that both the principals and most CSG teachers lacked the expertise or desire to explore possibilities for sharing pedagogical leadership in the local school organisations. However, in the few examples where brokers received a formal mandate with an explicitly designated role from principals in the local schools, important differences were noticed (cf. Leithwood et al. 2007). From a CoP perspective, these findings suggest principals’ support might be critical for brokers since it could strengthen a transfer process in which both participation and reification are considered.

It would be wise to emphasise that a one-sided focus on boundary objects, even with a closed character, is by no means an incorrect prioritisation. For instance, the assessment matrices and templates were distributed through the web-based communication programmes and, thereby, they became available for teachers in the local schools. However, it is worth stressing that it is the combination of boundary objects and brokering that generates a stable transfer process and holds
the potential to foster learning processes in the local schools. In the particular case referred to in this article, brokers could have compensated for the fact that the boundary objects had some shortcomings, or that they were mostly designed in a closed way. Consequently, these objects became quite reified from the local practices since they were not translated by brokers utilising their multimembership for making the transfer from general principles to local practice. In other words, the local schools could have benefitted more from the work carried out in the temporary organisation, i.e. received further access to the learning potential as emphasised by Miles (1964).

Conclusions
This article focused on a school-to-school collaboration in one Swedish municipality using a temporary system design. More precisely, the aim was to study how improvement ideas and practices developed in a collaborative project were transferred to the local schools. Findings from a qualitative case study, comprising audio-recorded observations \( (n = 13) \) and semi-structured interviews \( (n = 21) \), were used. Applying a social constructionist perspective, the framework for the analysis could be found in CoP theory and the duality between the theoretical concepts of boundary objects and brokering.

The analysis revealed that boundary objects with a closed character made up the main links for transfer between the temporary system and the local schools. This one-sided focus on closed objects reduced the potential to expand learning processes to the local schools. The analysis also indicated that the function of brokering was generally overlooked in the design work carried out. Alternatively, the managers of the improvement work put too much confidence in non-formal brokering roles. Either way, the findings show that principals’ support may be critical for brokering between temporary and permanent school organisations because a formal mandate or role could underpin a transfer process in which both participation and reification are considered.

To conclude, the findings in this article suggest the concepts of boundary objects and brokering, and the duality between those two concepts, could widen our understanding of transfer in school-to-school collaborations. By considering the two concepts, both separately and combined, this might also broaden our expertise of how to design and link educational learning communities together. The results presented in this article also suggest that if we intend to transfer knowledge and competencies that could foster learning discussions and impact the organisational level of schools, we have to consider boundary objects with a more open-ended character and the function of formal brokers – and particularly how to create an effective combination of the two.

Finally, the benefits and limits of the case study approach have to be stated. For example, this collaboration project contained a temporary system design and a
middle-level organisation, e.g. in contrast to loosely-coupled networks in which teachers meet directly across schools. However, even if the findings in this article are linked to a particular setting, they might still expand our understanding of how permanent school organisations can capitalise on improvement work carried out in a separate organisational unit. This stands out as an important topic that requires further discussion, particularly as we are heavily investing time and money at present. This article has drawn on one possible framework to expand the understanding of the critical link of transfer and to explain how to connect educational learning communities together. That is, by taking a social constructionist perspective directed by the concepts of boundary objects and brokering, this might also constitute a starting point to guide professionals in local schools working on improvement programmes.

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