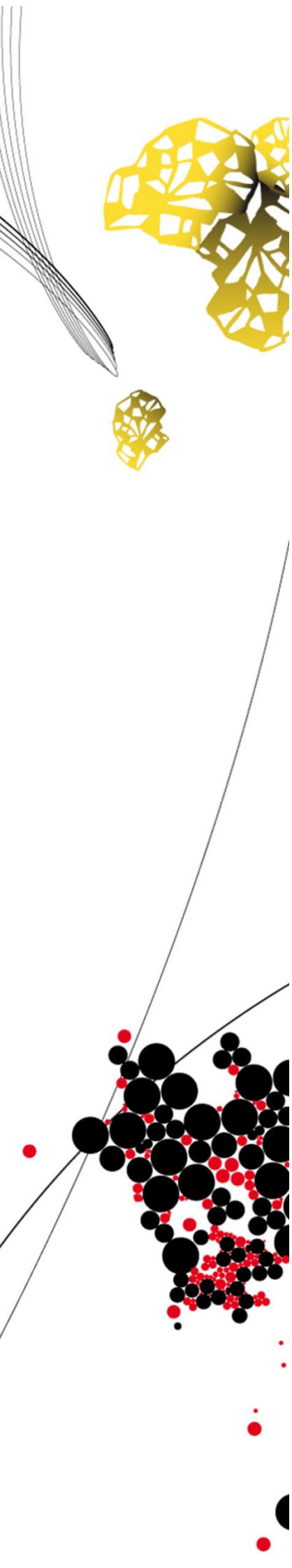

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Effect of Knowledge Sharing and Brokerage on the Sustainability of Data Use

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Summary

Data use plays an increasingly important role in decision making in education and can improve educational results. The data team intervention is a professional development tool that uses an eight-step iterative cycle to train educators in their skills and knowledge to use data in their educational practice. To further improve and promote the data team intervention and data use in education it is important to study what makes data use sustainable in secondary schools. Knowledge sharing and brokerage are identified as key factors in influencing the sustainability of data use. There is however, a lack of in-depth research on how knowledge sharing and brokerage influence sustainability of data use. Therefore, this study attempts to find an answer on how knowledge sharing and brokerage influence the sustainability of data use in secondary schools that participated in the data team intervention. In terms of knowledge sharing, it is hypothesized that schools with sustainable data use perceive more reciprocity, less centralization and effectively and inclusively share knowledge within the data team. Furthermore, it is hypothesized that schools with sustainable data use have more actively or effectively brokered knowledge on the educational problem and the data team intervention.

This qualitative study is an instrumental multiple-case study, which compared the perception of knowledge sharing and brokerage behavior between schools that have different degrees of sustained data use. Semi-structured interviews were conducted with thirteen respondents from two schools located in the eastern part of the Netherlands. The respondents were selected out of five levels within the organizational structure of the school. The results present the analysis of the interviews structured per construct and school.

It is concluded that a high degree of perceived reciprocity and a low centrality within the data team, accompanied by knowledge sharing on both the data team intervention and the educational problem related to the school with more clearly sustained data use. A higher degree of centralization within the data team related to a lower degree of sustained data. Furthermore, it was concluded more effective knowledge brokerage, mainly on the educational problem, to the involved teacher team and management related to a higher degree of sustainability.

The findings will contribute to the sustainability of data use in education and the data team intervention.

Foreword

Writing my thesis has been a long, informative process during which I was able to focus on a topic that interests me greatly, namely the improvement of education. I would like to thank my supervisors dr. H.C. Prenger and dr. C.L. Poortman for their effort, support and constructive feedback. I greatly appreciated their support and sincere interest. I would like to thank A.P.M. Tappel for her effort, collaboration and support and wish her the best of luck in achieving her PhD. In addition, I would like to thank dr. K. Schildkamp for her involvement and support at the start of my thesis. Finally, I would like to thank my loving partner, family and friends who supported and helped me during my study and final project.

1. Introduction

1.1. Rationale

In today's education, it is becoming more important for policy makers and educationalists to base decisions on data. Data use has been promoted globally in the last years and is often used to account for actions and decision making (Datnow & Hubbard, 2015). Furthermore, data use has been described as a key strategy to enhance improvement in education (Coburn & Turner, 2012; Schildkamp & Poortman, 2015; McNaughton, Lai, & Hsiao, 2012). Data-based decision making, from now on data use, can be defined as systematically gathering and using data that represents aspects of the school to improve the quality of education (Lai & Schildkamp, 2013). Examples of data are outcomes of teacher satisfaction questionnaires, learner outcomes, or findings from the inspectorate. Data use has been found more effective than decision making without data (Schildkamp & Poortman, 2015). And perhaps most important, data use in education can improve student achievement (McNaughton, Lai, & Hsiao, 2012). In short, data use is an important factor for improving education, guiding decision making, and a helpful tool in this era of accountability.

Decision making on policy and practice in Dutch secondary schools is often not based on data, but rather on experience, anecdotal information, or intuition (Schildkamp & Kuiper, 2010). This can be an ineffective and expensive way of adjusting policy, since unfounded reforms are often not sustainable or do not produce the desired effects (Hargreaves, 2003). Lai and Schildkamp (2013) found possible explanations for this lack of data use, such as scarcity of time, managerial pressure, or lack of skills to properly use data. The inability of schools to base decisions on data, indicates that there is still room for improving data use in Dutch education. This is emphasized by Coburn and Turner (2012) by stating that, despite data use being a key strategy for the improvement of educational results, little empirical research is available.

One possible intervention to support schools in their data use is the data team intervention developed by Schildkamp, et al. (2015). This intervention has proven to increase knowledge and skill for data use in education (Ebbeler, Poortman, Schildkamp, & Pieters, 2016) and help schools solve educational problems (Poortman & Schildkamp, 2016). The intervention consists of an iterative, systematic eight step program that trains data teams how to gather, interpret, and use data for decision making and practice, with the goal of improving educational results.

To further promote and improve data use in education, it is necessary to investigate to what extent data use is sustainable and which factors affect the sustainability. Sustainability is defined by Fullan (2007) as the changes within schools that last. Sustainability is of importance because it is cost and time inefficient to engage in a reform that will not sustain after support has been removed. The

need to find out what makes interventions sustainable is pointed out by Hargreaves (2003), by stating that many reforms and professional development intervention fail to be sustained after support is removed. This claim is supported by Coburn and Turner (2012) and Fullan (2007).

Sustainability of data use is influenced by many factors, of which one key factor is the way how knowledge is shared within, and brokered by a team (e.g., Ebbeler, et al., 2016). There is a lack of in-depth research on knowledge sharing and brokerage as influencing factors on sustainability (Hubers, 2016). Furthermore, it is necessary to study data use on multiple levels in education, to understand data use more deeply (Coburn, Touré, & Yamashita, 2009; Feldman & Tung, 2001; Honig & Venkateswaran, 2012). Therefore, this study focusses on five levels within the school system, namely: individual teacher level, teacher team level, team leader level, school management level and schoolboard level. This research focusses on gaining in-depth insight on which aspects of knowledge sharing and knowledge brokerage, in five levels of the organization, influence the sustainability of data use in secondary schools, that participated in the data team intervention.

2. Theoretical framework

In this chapter the data team intervention, constructs and corresponding definitions are described. The chapter is concluded with the main and sub research questions.

2.1. Data use

Data use is an interactive process that can improve educational results, helps with decision making and is a helpful tool in the era of accountability. Coburn and Turner (2011) define the data use process as that what happens when people interact with data. Data use is a complex process that interacts with its surroundings and involves a high degree of interpretation from the users end, because data on itself does not carry meaning (Coburn & Turner, 2012). The users need to notice data, understand the data and its implications, and plan action based on the findings (Coburn & Turner, 2012). Coburn and Turner (2011) state that data use is 'fundamentally interactive, influenced by characteristics of the individuals involved and the dynamics of the social interaction (p.175).'

Figure 1 depicts an alteration of the data use theory of action developed by Schildkamp and Poortman (2015). The data use theory of action represents the users' activities during the process of data use, which is the basis for the data team intervention. The first step of the data use theory of action is the purpose. Subsequently users gather data and form hypotheses (step 1), filter, quality check, organize, analyze, and interpret data, and confirm or discard the hypotheses (step 2). This information is combined with the understanding and expertise of the data team members to form knowledge (step 3), which will be transferred into action (step 4). During step two, three, and four, the effectiveness of the actions is evaluated, and if deemed unsatisfactory (e.g. quality of data is

insufficient) the users (partially) redo a step (step 5). The data use theory of action is an iterative cycle that starts with a purpose and leads to changes in educational practice.

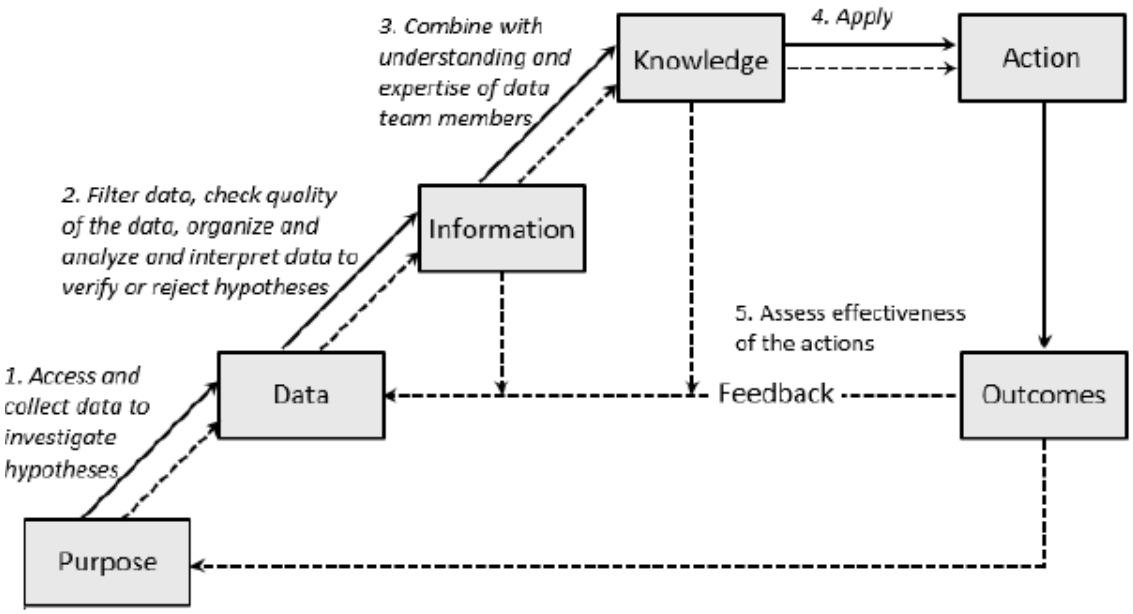

Figure 1. Data Use Theory of Action (Derived from Schildkamp & Poortman, 2015, p.5.).

2.2. Data team intervention

The data team intervention educates colleagues on how to use data to solve problems the school faces (e.g. low grades, high dropout rates). The data team creates knowledge and skills regarding the use of data (Ebbeler, et al., 2016). The goal of the intervention is professional development, to improve education and ultimately the learner results. The data team intervention is a model designed as a systematic, iterative eight-step approach (see figure 2) for professional development and educational improvement developed by Schildkamp, et al. (2015) based on Earl and Katz (2006) and includes all steps of the data use theory of action (Schildkamp & Poortman, 2015) as explained in the previous section. The data team intervention creates knowledge and skills for data use (Ebbeler, et al., 2016). A data team is a team of six to eight people, consisting of one or two school leaders (e.g. team or department head) and four to six colleagues.

Implementing the data team intervention in a school means that the data team is guided by an external coach for two years and the school must meet certain prerequisites for the intervention to be successful. Especially the two years of external guidance have proven to be crucial for success (Schildkamp et al, 2015). The prerequisites consist of characteristics of the data (e.g. quality and availability of data), the organization (e.g. able to facilitate and share leadership), individuals (e.g. pedagogical and didactical knowledge), and the team (e.g. knowledge of the organizational structure, attitude towards data use).

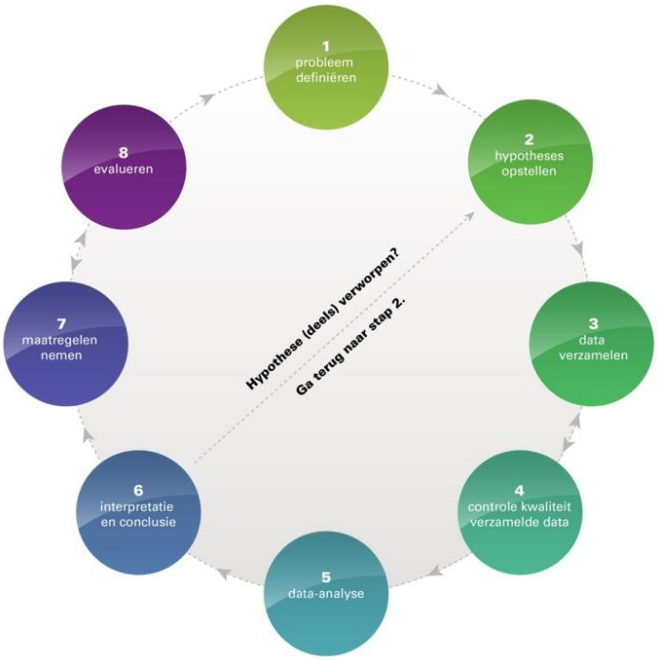

Figure 2: eight-step method of the data team intervention

The eight-step cycle (Schildkamp, et al., 2014) starts with the *problem statement*. During the first step, the data team decides which of all the problems the school faces will be selected and the desired situation will be formulated as a goal. This goal should be formulated in a specific and measurable way.

Step two consists of formulating the hypotheses based on the problem statement. While forming a hypothesis, the team should decide if they want to explore or clarify the problem. Where an exploratory hypothesis tries to further establish the problem, a clarifying hypothesis aims to find the cause. As well as the problem statement, the hypotheses should also be formulated specific and measurable.

The third step, is the collection of data for the specific hypotheses that were formulated. The teams can use numeral sources of data, divided into three groups; input (e.g. student characteristics), process (e.g. pedagogics, or student/parent feedback) and output data (e.g. school or exam results). In the data team intervention, it is encouraged that the team uses already gathered data, since this is more time efficient. If the hypotheses cannot be examined with existing data, new data must be gathered, preferably with already validated tools.

The fourth step is the quality check of the gathered data. The two most important factors for the quality of the data are validity and reliability. Reliability concerns the extent to which the data is free from chance. Validity concerns the accuracy of the measurements. Does the tool measure what has been intended to be measured? If the quality of the data can be ensured, the team can move on to the fifth step of the cycle.

The fifth step entails the analysis of data and involves the preparation and organizing of the data before interpretation. Data should be made insightful by visualizing and summarizing the collected qualitative and/or quantitative data. For quantitative data, this can be done by, for instance, the use of graphs. Qualitative data are more difficult to summarize, however organizing it in tables and clustering data can make it easier to interpret.

The sixth step is forming a conclusion based on the interpretation of the gathered, verified, and organized data. The data team should consider limitations of the data and include this while interpreting the data and forming a conclusion. After forming a conclusion in step six, there are multiple options to continue in the cycle. If the conclusion is that the hypothesis needs to be rejected, the team should form a new hypothesis and continue the research. If the conclusion is that the hypotheses can be accepted the team can take measures in solving the problem. A third option is a combination of both, where measures can be taken to solve the problem partially and new hypotheses can be formed to tackle the remaining part of the problem or newly arisen problems.

The seventh step is taking measures based on the with data established conclusion. Firstly, the data team should gather possible improvement measures for solving the problem. The measure most suitable to the problem statement and the conclusion should be chosen. Furthermore, the measurement should address the cause of the problem. Based on the most suited measurement an implementation plan, including timetable, possible pilot, and evaluation scheme, should be constructed.

The last step in the cycle is the evaluation of the process and the effectiveness of the measures. Depending on how specific the hypotheses were formulated, a concrete evaluation of the effectiveness can be made. The evaluation should be made based on data, to prove the effectiveness of the measurements and the process. This eight-step iterative process is a concrete method to bring the data use theory of action in practice.

2.3. Sustainability

Since data use is an effective tool for educational improvement (Datnow & Hubbard, 2015; Coburn & Turner, 2012; Lai & Schildkamp, 2013; Schildkamp & Poortman, 2015; McNaughton, Lai, & Hsiao, 2012; Stringfield, Reynolds, & Schaffer, 2012), it is highly preferable that data use will continue when external support on the data team intervention is withdrawn (Hargreaves, 2003; Fullan, 2007; Coburn & Turner, 2012). The intention of the data team intervention is to incorporate a sustained practice of systematic data use for educational improvement within an organization or team.

Sustainability within education is defined in numeral ways. To form a more reliable definition, an analysis of the literature regarding the sustainability of data use has been conducted, which resulted in a matrix (see Table 1). Table 1 shows that the definitions found in the literature

share commonalities. These reoccurring factors are: sustainable data use takes place during regular work without causing interruption, is an ongoing process and the intervention is visible through routines within the organization. In which organizational routines are divided in the ostensive and performative aspect (Feldman & Pentland, 2003). The ostensive aspect is defined as the perception or structure of the routine, such as team or policy plans. The performative aspect is defined as the specific actions that are undertaken that constitute the organizational routine. An example of the performative aspect of routines is how data is used in the daily practice of teachers, such as using test data to adjust the curriculum.

To summarize, when comparing the definitions of sustainability within organizational reform and data use the following definition is formed: S*ustainability is achieved when the intervention is evident through both ostensive and performative organizational routines, which are non-disruptive of ongoing work, with the goal of continuous improvement.*

Table 1

Literature matrix definition sustainability

Author	Definition	Patterns in behavior	During ongoing work (without being disruptive)	Ongoing process (after removal of support)
Coburn & Turner (2012)	Routines for data use that are recurrent and patterned interactions that guide engagement with data and people during their ongoing work.	■	■	
Hagreaves & Fink (2008)	Development of initiatives without compromising the development of others in the surrounding environment, now and in the future.		■	■
Fullan (2005) p. ix	'The capacity of a system to engage in the complexities of continuous improvement consistent with deep values of human purpose'	■		■
Coburn, Russel, Kaufman, Stein, (2012)	The degree to which reform-related practices continue in high-quality ways after support for these practices has dissipated	■		■
Copland, 2003	Embedding reform work into the culture of the school	■		■

Sustainability of data use plays a role on multiple levels within schools through organizational routines (Coburn, Touré, & Yamashita, 2009; Feldman & Tung, 2001; Honig & Venkateswaran, 2012). This research distinguishes between five levels of the school organization that will be examined. These are in ascending order of hierarchy, individual teacher, teacher team, team leader, school management and schoolboard. Furthermore, sustainability is influenced by a

multitude of factors, of which knowledge dissemination, the current study's topic, plays an important role (Coburn, Touré, & Yamashita, 2009; Feldman & Tung, 2001). More recently and in regard of the current intervention Ebbeler (2016) and Hubers (2016) state that the way the data team members share their knowledge with other colleagues is a key challenge regarding the sustainability of the data team intervention, and an important topic for future research.

This study makes a distinction between knowledge sharing and knowledge brokerage. Both play a role in sustainable data use by building capacity within the data team but also within the organization. Capacity building can be defined as being able, on all levels of the organization, to sustain and act upon learning, with the collective goal of improving educational results (Stoll, 2010; Stoll & Earl, 2003). Where knowledge sharing builds capacity within the data team by creating knowledge and skills to use data, knowledge brokerage builds capacity by extending that know-how to the rest of the school (Dobbins et al., 2009; Ward et al., 2009).

2.4. Knowledge sharing and brokerage

Knowledge sharing and knowledge brokerage are factors that can influence capacity building for data use, which in turn affects the sustainability of the intervention. There is a commonality between the types of knowledge that can be shared or brokered. The first type of knowledge is knowledge on data use, in a general sense and specific for the current data team process (e.g. how to form hypotheses). The second form is knowledge on the educational problem that the data team is attending to (e.g. implications for educational practice). The distinction between knowledge sharing and knowledge brokerage is of importance since both have different mechanisms and characteristics. This distinction has also been made in former research regarding knowledge dissemination behavior and the effectiveness of data use and the data team intervention (Hubers, Poortman, Schildkamp, Pieters, & Handelzalts, 2016; Hubers, Moolenaar, Schildkamp, Daly, Handelzalts, & Pieters, 2018).

There is still a lot unknown about how knowledge sharing and brokerage works, which contextual factors are of influence, its effectiveness, how to evaluate the process and how it is of influence on other aspects, such as sustainability (Conklin, Hallsworth, Hatziandrue, & Grant, 2008; Wang & Noe, 2010). Moreover, Conklin and others (2008) conclude that a large amount of the available evidence base on knowledge brokerage is unreliable and inconclusive. Therefore, there is still a need for research investigating how knowledge sharing and brokerage influence the sustainability of data use.

2.4.1 Knowledge sharing

Knowledge sharing can be defined as sharing of task information and skills, used to, form, implement or cultivate ideas, processes or policies (Cummings, 2004). Knowledge sharing in the present study is restricted to the sharing of knowledge within the boundaries of the data team. Knowledge sharing within a team or organization is often measured and analyzed by the number of connections between members. By doing so, knowledge sharing can be measured by three characteristics, density, reciprocity, and centralization of the relationships within the network, which are likely to represent the sharing of knowledge (Hubers, et al., 2018). A qualitative approach to research social networks is growing in popularity and can provide benefits such as a more in-depth insight (Schepis, 2011). User perception of reciprocity and centralization can be approached with qualitative measures, such as logfiles or interviews. Density represents the number of social ties within the social network and can be measured by quantitative measures and not of interest for this study. The current study defines knowledge sharing as: *The process of sharing knowledge and skills within the data team, in terms of reciprocity and centralization, with the goal of developing capacity for data use.*

The present study will attempt to get a more in-depth view of the knowledge sharing characteristics reciprocity and centralization and their effect on the sustainability of data use. By using a qualitative approach more in-depth information on the sustainability of data use and its influencing factors can be gained. Reciprocity reflects the strength of the connections within the network. Reciprocity entails to which extent social ties are a joint and equal effort (Daly, 2012). For instance, reciprocity in the data team intervention can be expressed by the mutual motivation of team members to share knowledge regarding data use. Where a strong mutual tie to share knowledge, and help colleagues is associated with a high degree of reciprocity. A team with a higher degree of reciprocity is more likely to share knowledge over time (Keuning, Geel van, Visscher, Fox, & Moolenaar, 2016). Centralization is the allocation of resources, i.e. knowledge and skills, within the network (Hanneman & Riddle, 2005). For instance, centralization of knowledge in the data team intervention can be expressed by the perception of equal contribution of team members during the data team process. If one or two team members possess more knowledge and skills it is likely that they will contribute more to the process during team meetings, this is associated with a higher degree of centralization. In other words, the knowledge and skills regarding data use are centered around key individuals. It is more likely that data team members will share knowledge if there is a lower degree of centralization (Keuning, et al., 2016).

2.4.2 Knowledge brokerage

Knowledge brokerage is described in the literature in several ways, with different outcomes, broker roles and types. Of importance is that knowledge brokerage can be viewed as a process to promote data use for decision making (Ward, House, & Hamer, 2009; Dobbins et al., 2009; Magnuszewski, et al, 2010). In the present study knowledge brokerage is regarded as the dissemination of knowledge crossing the boundary of the data team. In other words, knowledge dissemination from within the data team to the colleagues that do not participate in a data team and vice versa.

First, a distinction is made between the goals of knowledge brokerage. Knowledge brokerage can function as a management system for knowledge, as a 'link and exchange' between policy and research, and as a tool to build capacity (Ward, et al., 2009). The latter is of interest for this study, knowledge brokerage can function as a bridge between evidence and practice, building capacity for practitioners to base action on data, by making it more accessible and providing knowledge and skill to use data (Dobbins et al., 2009; Ward et al., 2009).

Second, the distinction is made between three types of knowledge brokers; knowledge broker as individual, group or organization (Currie, Star, White, & Watson, 2010). This research will use knowledge brokerage as individual, where a person within the data team functions as the intermediary between the data team and the other colleagues within the school. Subsequently, this research defines knowledge brokerage as*: the process and the activities of key individuals within the data team that transfer and connect evidence to educational practice, in terms of inward, outward and forward brokerage, with the goal of building capacity within the organization for data use.*

In this study and in data team intervention related research (Hubers, et al., 2018) three broker roles are distinguished, namely outward, inward and forward brokerage (see figure 2). For these three types of knowledge brokerage, the broker functions as a bridge between the data team and the colleagues, without contact between the colleagues, allowing the broker to fulfill his role.

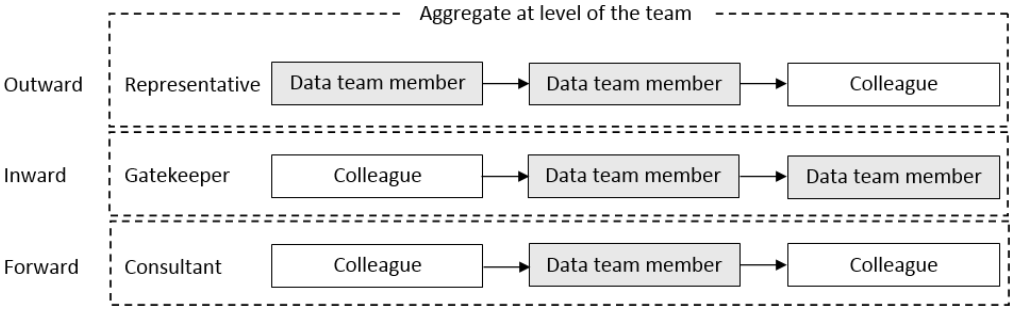

Figure 2. Three types of knowledge brokerage in the data team intervention *(Hubers, et al. 2018, p.6.)*

To clarify the roles of figure 2. an example of each roll is given. During outward brokerage, the broker assumes the role of representative. For instance, data team member 1 finds that a group of

students scores exceptionally high on a test and shares this with data team member 2. Data team member 2, who assumes the role of broker, shares the findings with responsible colleague.
During inward brokerage, the broker assumes the role of gatekeeper. For instance, a colleague shares their view on the educational problem the data team is addressing to a member of the data team. That data team member assumes the role of broker when the input from the colleague is shared with other data team members.
During forward brokerage, the broker assumes the role of consultant, transferring knowledge from one colleague to another. For example, colleague 1 successfully adapts his teaching based on the use of data, the broker shares the success and working method of colleague 1 with colleague 2.

2.5 Research question and model

Based on the theoretical framework (figure 2), this study attempts to find an answer on how knowledge sharing and brokerage relate to the sustainability of data use. This leads to the following research questions and sub questions:

Research question:
How do knowledge sharing and knowledge brokerage relate to the sustainability of data use in secondary schools that have worked with the data team intervention?

Sub questions:

a. How sustainable is data use in secondary schools that have worked with the data team intervention?
b. How is knowledge shared within the data teams in schools that have worked with the data team intervention?
c. How is knowledge brokered by the data team members in schools that have worked with the data team intervention?

2.6 Scientific and practical relevance

As discussed in the theoretical framework, there is still a need for research investigating how knowledge sharing and brokerage are of influence on the sustainability of data use. This study aims to give more in-depth knowledge on how knowledge sharing and brokerage influence sustainable data use, thereby deepening the evidence base. In turn, this can lead to additional directions for future research.

A more in-depth understanding on how knowledge sharing and brokerage influence sustainable data use can lead to improvements to the data team intervention and perhaps other data use interventions. More specifically, this study aims to provide insight in what effective

knowledge sharing and brokerage practices are to sustain data use and thereby add to the data team intervention and educational practice.

3. Method

This chapter describes the research design and methods used in the current study. Furthermore, the selection process of respondents, the development of instrumentation, the gathering and analysis of the data are reported.

3.1 Research design

To answer the main research questions and three sub questions, interviews were conducted on the five determined levels in two secondary schools that used the data team intervention. The aim of the cross-case study is to gain in-depth insight in how knowledge sharing and brokerage relate to the sustainability of data use. The present study used semi-structured interviews to gather the data. Semi-structured interviews have a fixed set of questions to structure the interview and promote reliability through making the research repeatable, while allowing the interviewer with the opportunity to gather more information through inquiry (Freebody, 2011). Semi-structured interviews were the appropriate instrument, since these allow respondents to voice their own opinion for more extensive information (Baarda, et al., 2015). Additionally, semi-structured interviews offered the opportunity to compare the answers from respondents from different schools to each other and to promote validity in terms of going into the questions that are relevant for the research question.

Three interviewers related to the University of Twente conducted the interviews. This approach was suitable because the study aimed to compare the knowledge sharing and brokerage between schools that appeared to sustain data use after support was removed and schools that did not or to a lesser extent sustain data use. Furthermore, these findings were triangulated with a document study with documents of both schools such as policy plans and the school guide. In addition, trainer's logs from the data team intervention from both schools from the years 2013, 2014 and 2015 were used for the triangulation. Triangulation in social science is used to approach a topic from different standpoints and support the reliability of the study's findings (Bryman, 2016; Olsen, 2004).

3.2 Respondents

The researchers selected two schools that were presumed to have different rates of sustained data use after the data team intervention. The schools were selected from all the schools in the eastern part of the Netherlands that participated in the data team intervention. The selection was based on

the experiences the researchers had during previous data team related follow-up studies. This resulted in two schools, where one school was expected to have sustained data use to a high extent when support was removed and the other schools sustained data use to a lesser extent when support was removed. This is deemed to be an appropriate approach, since this study aims to compare the knowledge dissemination behavior on schools with different levels of data use sustainability.

To get a more complete understanding on the sustained data use it was necessary to study data use on multiple levels in education (Honig & Venkateswaran, 2012). The current study distinguishes five levels within the organization, namely: schoolboard level, school leader level, team leader level, data team member level and teacher level. From the schoolboard level one respondent was selected to represent both schools. From the schoolboard level only one respondent was selected because both schools were represented by the same schoolboard. One respondent was selected on each school on the school leader level. On the team leader level one respondent was chosen on both schools. On the data team level two colleagues on both schools were interviewed, on school A the employee responsible for the quality of education joined the interview. Lastly, on the teacher level, two colleagues on each school were selected that did not participate in the data team intervention. In total there were thirteen respondents participating. These respondents were selected, including the educational quality assurance manager (kwaliteitsmedewerker in Dutch), because they are deemed to be a good representation of the five different layers within the organization. On both the data team and teacher level multiple respondents were selected to enable a more complete recollection of the data team intervention and the process.

3.3 Instrumentation

3.3.1 Interview schemes

The study made use of semi-structured interviews to gain in-depth view in the knowledge sharing and brokerage behavior in the schools. The interview questions were based on the operationalization of the constructs sustainability (see table 2), knowledge sharing (see table 3), knowledge brokerage (see table 4) and existing interviews and questionnaires focused on data use were consulted for example questions (Hubers, et al., 2018; Schildkamp, Poortman, Ebbeler, & Luyten, 2017; Prenger & Schildkamp, 2018). The operationalization of constructs was based on the method in Baarda, et al. (2015). Furthermore, the guidelines in Bryman (2016) on preparing an interview guide were considered when constructing and conducting the interview. The interview was written and conducted in Dutch because the study took place on two Dutch secondary schools. The interview based on the constructs was pilot tested with a former data team member from a

different school. After the pilot study some adjustments in phrasing, formulation and the order of questions were made to the interview. The interview schemes were differentiated for each level within the organization to ensure the interviews fitted the respondents. This resulted in four interview schemes (see appendix A, B, C, and D). The interview schemes are part of a larger interview scheme used for a PhD study on sustainable data use. The interview schemes for this study focused on knowledge sharing and knowledge brokerage. In addition to the prepared questions the interviewer will attempt to gain more information by enquiry.

Table 2

Operationalization of Sustainability

Construct and definition	Dimensions	Indicators
Sustainability S*ustainability is achieved when the intervention is evident through both ostensive and performative organizational routines, which are adapted to the needs of the organization, while there is strive for the continuation of improvement.*	1. Organizational routines	1.1. Ostensive 1.2. Performative
	2. Data use adapted to the needs of the organization	2.1. Adapted to needs school
	3. Continuation of improvement	3.1 Improvement of educational practice
		3.2. Improvement of data use

Table 3

Operationalization of Knowledge Sharing

Construct and definition	Dimensions	Indicators
Knowledge Sharing *The process of sharing knowledge and skills within the data team, in terms of*	1. Reciprocity	1.1. Mutual relationship

reciprocity and centralization, with the goal of developing capacity for data use.		
	2. Centralization	2.1. Equal contribution
	3. Knowledge sharing	3.1. Knowledge sharing regarding data use. 3.2. Knowledge sharing regarding educational problem.

Table 4

Operationalization of Knowledge Brokerage

Construct and definition	Dimensions	Indicators
Knowledge Brokerage *The process and the activities of key individuals within the data team that transfer and connect evidence to educational practice, in terms of inward, outward and forward brokerage, with the goal of building capacity within the organization for data use.*	1. Outward brokerage 'representative'	1.1. Brokerage from data team member via 'representative' to colleague.
	2.Inward brokerage 'gatekeeper'	2.1. Brokerage from colleague via 'gatekeeper' to data team member.
	3. Forward brokerage 'consultant'	3.1 Brokerage from colleague via 'consultant' to data team member.
	4. Knowledge brokerage	4.1. Knowledge brokerage regarding data use. 4.2. Knowledge brokerage regarding educational problem.

3.3.2 School Documents

In addition to the interview fragments, school documents and trainer's logs of the support sessions of the data team intervention were analyzed. The provided school documents consist of a multiple

year policy plan (meerjarenbeleidsplan in Dutch) and a school guide 2017-2018 (schoolgids in Dutch) for both locations. Additionally, the strategic policy plan of the organization describes the goals of the umbrella organization that both schools are a part of. These documents are fitting for triangulation because documentation of data use is determined as the indicator 'ostensive' in the construct 'sustainability. The school guide is the document the schools distribute to parents and pupils to present information about the school's policies, vocal points, goals and regulations. In the multiple year policy plan the policies and goals for the upcoming years for the specific school are described. And lastly, in the strategic policy plan of the organization the vocal points, direction for the future and goals for the umbrella organization are described.

3.3.3 Trainer's Logs

The third source of data for the triangulation were trainer's logs from the training sessions the original data team members had when they started with the first data teams. The trainer's logs were written by the instructors of the data team intervention affiliated with the University of Twente. The logs of School A span the period of 09/22/2014 till 06/29/2015. The logs of School B span the period of 09/04/2013 till 06/11/2015. The logs describe the following: 'school/organization', 'Data and data systems', 'Skills data use team members', 'how did the team perform during the current step of the data team cycle', 'Which interventions from the trainer helped the team', 'What stood out in the interaction within the team', and 'Suggestions for improvement and additions'. The trainer's logs were analyzed based on the coding scheme (see appendix I). The trainer's logs were used to reach a more reliable conclusion on all three constructs, because these were included in the observations of the trainer.

3.4 Procedure

Preceding the gathering of data, the ethics commission of the University of Twente was asked for approval for this study (see appendix E). All respondents were informed on the purpose of the interview and the study with a briefing preceding the interview and a letter (see appendix F). In addition, the respondents were asked for consent (see appendix G), before conducting and recording the semi-structured interviews. Respondents were asked for their function in the school and their role in the data team intervention (see appendix H) prior to the interview, providing an approach for categorizing the interviews by the corresponding levels within the organization. All documents (appendix E, F, G, and H) were written in Dutch.

The interviews were conducted at the locations of the schools, during or after school hours. The interviews had a maximum duration of 45 minutes and were voice recorded. The setting of the interviews was in an office in the schools and was conducted in a formal style. There were one or

two interviewer(s) and one, two or three respondent(s) present during the interviews. The three interviewers were all affiliated with the University of Twente. One of the interviewers was also affiliated with school B. To avoid interviewer bias that interview did not conduct any of the interviews at school B. In addition, the interviewers tried to maintain a neutral role during the interviews to negate the asymmetrical power relationship between interviewer and interviewee (Kvale, 2002). Abdicating the roll of knowledgeable researcher and trying to act as an attentive observer. Furthermore, the interviewee had the opportunity to ask questions about the interview and the research, was thanked for their participation, and offered the possibility for further contact and to receive the final report of the study.

Lastly, the interview with the school leader of school A was not used for this research. The audio file was not useable for processing due to technical issues.

3.5 Data analysis

Data analysis of the qualitative data was carried out using the qualitative analyses tool Atlas.ti. The audio recordings of the interviews first were transcribed, exactly and entirely. The transcripts then were coded based on a coding scheme (see appendix I) and structured accordingly.

The coding scheme was based on the operationalization of the constructs *Sustainability, Knowledge Brokerage, and Knowledge Sharing*. It was decided to add the construct 'forms of continuation of the data team intervention' to be able to capture the current form of the data team intervention. The decision to add this construct was based on the perceived need to separate the data that loaded on the dimension *data use adapted to needs of the organization* in more specific categories. This resulted in a coding scheme (See appendix I) where examples of phrases were added to each indicator and code of the three constructs. The coding scheme was used to code the transcripts in the program Atlas.ti. To be more confident in the reliability of the coding scheme and the findings, the interrater reliability was calculated with the assistance of a second coder. The interrater reliability measures the amount of the consensus between coders is based on chance. Hodson (1999) advises to use ten percent of the total data for measuring the interrater reliability. For this measurement ten percent of the total fragments were selected for the second coder to re-code. To ensure a good representation of all data, fragments were randomly selected out of all the documents in proportion to the number of fragments of each indicator. For instance, the code A.3.1 'improvement education' was used 61 times, so six fragments A.3.1. were randomly selected from the different documents.

However, during coding it was found that the construct 'forms of continuation of the data team intervention' had too much similarities with the indicator A.2.1. 'Needs of the school' of the construct 'Sustainability'. This overlap caused confusion and was responsible for a large part of the

variance in the reliability check of the coding. Thus, after consultation with the second coder and a following appointment with the supervisors the consensus was reached to delete construct 'forms of continuation of the data team intervention'. Additionally, some small changes were made in the formulation of examples to make them clearer and fitting to the transcripts. This resulted in a Kappa score of 0.79, which can be considered substantial Cohen (1960). Differences were discussed with the second coder, after which consensus on the coding scheme was reached.

4. Results

The results of the interviews, document study and trainer's logs are structured by school and per constructs sustainability, knowledge sharing and knowledge brokerage and presented in a summarized manner.

Data teams school A and B

The data team of school A consisted of six members. The members are one team leader, one educational quality assurance manager and four colleagues that teach the first-year groups of secondary education. The data team stayed in this configuration for the duration of the intervention. The goal of the data team was improving educational results in the first-year groups. More specifically, the results of the core subjects' courses like mathematics and the Dutch language.
The team started with eight members, consisting of a team leader, educational quality assurance manager and six colleagues from the two sectors HAVO and VMBO-GT. Due to illness in the team and the school several adjustments to the team have been made. The team ended with seven of the original eight members. The goal of the data team was to increase the percentage of students that follow educational track HAVO after two years of the educational track HAVO-GT. For clarity, the term data team members refers to the educators that participated in the data team intervention, in practice the data team members also function as teachers at the schools.

4.1 Sustainability

The ostensive and performative routines are the leading headers in the results of sustainability. The constructs intervention adapted to needs school, improvement education, and improvement data use, have some overlap with the performative aspect. For instance, how the data team intervention is currently present in the school can be considered an adaptation to the needs of the school in addition to the performative aspect of a routine. These results are presented under the more specific header.

4.1.1 School Board

Ostensive

The member of the school board stated that data use for improvement of educational quality is included in the strategic policy plan of the organization. Confirming this, in the strategic policy plan it was specifically stated that the organization uses data teams to systematically evaluate, improve and innovate their education. Furthermore, content related feedback on the process is needed for the organization to progress in a more general sense; the document stated for instance that: '*We systematically evaluate our educational results and improve our education continuously with the goal of increasing the educational results of each student.'*

The organization continues to develop their educational quality assurance system, which informs them on the quality of education and organization and that enables continuous and adequate evaluation. In addition, the document stated that employees can reliably improve and innovate, implying that employees have some knowledge and skills in data use.

Performative

The member of the school board stated that they give account on the educational quality. They do that with an educational quality assurance system for the entire school system. At least once a year the management concluded the management conversation cycle based on data of all school generated by a central point. They made sure this is a validated data package and is the basis for evaluation with all the highest involved stakeholders. In addition to this meeting other conversations based on data occur, for instance with the inspectorate of education.

Intervention adapted to needs school

The board member made no mention of the intervention adapting to the needs of the schools.

Improvement education

The board member stated that he thinks that data use for educational improvement is becoming more regular during daily practice on schools, but at this moment is underdeveloped and overlooked. Confirming the claim that data use for educational improvement is increasing in daily practice, the logs of both schools extensively mentioned that the goal of the data teams was to improve educational performance.

Improvement data use

To improve data use data team members had to enroll in courses regarding data use. These initial

courses were a necessity. The school board member did not suspect that the starting data team members hardly possessed the knowledge needed for data use and research. Methodology, statistics and the data team intervention methodology were the focus of these courses and were tested. Furthermore, he stated that he thinks that people learned a lot from the data team intervention. In particularly, validated data use for improving educational quality and school practice.

4.1.2 Sustainability School A

Ostensive

Data team members stated that data use is not included in the course curriculum (vakleerplan in Dutch) and their domain's team strategy document (teamleerplan in Dutch). Contradicting, both the teachers stated that data use is mentioned in the course and the team strategy document. The team leader, whom was also a member of the data team supported this with the statement: '*Working with data does get mentioned in the sense of, it comes back in a team's and location's strategy document.'* The multiple year policy plan stated that school leaders carry out domain meetings via a fixed format at least one time a year, which include data such as satisfaction studies and exam results.

Both documents, strategic policy plan of the organization, the multiple year policy plan stated that multiple sources of data are used to improve education. For instance: '*Evidently, the educational goals, personalized BYOD-education, examination and RTTI, the pedagogical- and didactical approach, satisfaction studies, and the exam results are conversational topics.'* The school guide only mentions educational improvement as a goal.

The multiple year policy plan stated that the school likes to continue to focus on teacher's competences and shift towards a more personalized educational program. Furthermore, it stated that colleagues learn from and with each other. Additionally, they would like to continue improving competences of all colleagues. For instance, they stimulate learning from each other by appointing expert-colleagues to share their expertise.

Performative

The teachers stated that data use certainly is a returning topic in team and section meetings. The team leader said that the topic data use returns once or twice per year in team meetings. In a section meeting it was a topic of interest in addition to the discussing of the results of the school. Furthermore, she stated that data use was a main topic in school board meetings during the start of the data team project, in time this turned into a common theme in the meetings.

Intervention adapted to needs school

The team leader stated that the data team intervention was not directly used in the school. However, she confirmed that the educational quality assurance manager and her still monitor the implemented measures and that in a broader sense the data team intervention was still part of the school. She mentioned that if it is needed that she would use the intervention again. She mentioned that she finds all eight steps equally important and help to focus, but in future use might dwell longer on certain steps.

The data team members stated that there is no data team active on a problem, but there are still data team members that monitor the progress of the implemented measures, which does not happen in the spirit of the eight steps of the intervention. Additionally, one member, the educational quality assurance manager stated that if she gets called in for help with a problem, she keeps the intervention in the back of her mind and tries to base the meetings on data. Furthermore, she has not seen colleagues using the data team intervention, nor linking the data team intervention to practice. In the interview with the teachers no mention of adaptation to the needs of the school was made.

Improvement education

The educational quality assurance manager stated that every year and every quartile exam and educational results are analyzed, and a prognosis is made, which all are input for improving education. The teachers stated that data use, such as test exams and observations, are important for the education they give. They specifically mentioned RTTI as a tool they use for the improvement of education, which is stimulated by the board and school leaders. They use this data to personalize education for pupils and decision making for the educational paths of pupils. They thought that the data team intervention could have led to a better ability to differentiate in education.

The team leader stated that data is used quite a lot, for example exam results, grades of multiple years, and data on pupils when starting, finishing and switching educational tracks. She explicitly stated: '*We work on a structural basis with data to ensure the quality of our education. Not as a means of a penalization culture, but for the improvement of education.*' The data team intervention helped them to direct efforts to improve education to their organization instead of looking for the cause or a solution outside. She thought the board stimulates and facilitates data use for educational improvement and points out that what can be of importance for the quality of education. Furthermore, she stated that team meetings are centered around improving education in both a concrete and theoretical manner. A data team member stated that not a lot of data is used as input for team or section meetings. Another data team member confirms this and stated that only

the exam and test results are used during team and section meetings and IPB-meetings.
In the trainer's logs of school A there was extensively mentioned that the goal of data team was to improve educational performance, more specifically how to improve the somewhat disappointing yields of the lower classes (OB-yields).

Improvement data use

The data team members and team leader stated that they tended to go too fast through the eight steps of the data team intervention cycle. This was caused by the temptation to solve the problem too soon. The team leader stated that the pace improved towards the end.

The teachers claimed that they talk about how to test. In a section meeting with the school leaders they discussed about RTTI and gathering data. An important aspect for them is that it needs to be efficient and balanced. It may cost time, but then it must produce results for their education. The team leader experienced that colleagues are consciously working with data. '*How do you work with data, and what does it yield.*' She stated that a shift has taken place towards an evidence-based decision-making mindset within the organization. Problems are no longer dismissed as the inability of the pupil, but the teacher teams search for the underlying cause and try to correct it.

The trainers' logs showed clear learning moments in data use in the data team and the school, such as: '*The team gathers more knowledge on how to use the intervention and data use.*' And '*Discussing the data team was a real eye-opener for some people*.'

4.1.3 Sustainability School B

Ostensive

The data team members stated that data use is mentioned in domain learning plans, and the multiple year policy plan. However, they stated that the teachers did not receive hours to work with data, nor is it mentioned on their task list.

The strategic policy plan of the organization stated that data teams are used to evaluate, improve and innovate education. Furthermore, systematically gathering data for taking responsibility, adjusting education and planning their marketing position is mentioned multiple times in the multiple year policy plan. The school guide stated a broad spectrum of data the school collects for educational quality assurance. The multiple year policy plan stated that the school systematically gathers data to evaluate, analyze and improve education. Furthermore, it stated that the gathered data is input for teams, sectors, and domains to construct improvement plans. Additionally, evaluation, feedback and reflection help to improve the organization and that they want to ensure that developments are sustainable.

All documents stated that multiple sources of data are used to improve education. For instance: '*Means for educational quality assurance that are used are among others: Evaluating and discussing data on starting, finishing and switching educational tracks with those involved, teams, colleagues and domain groups.*' The multiple year policy plan of school B and the school guide both stated that active collaboration and communication in teams, sections, domains and professional learning community is self-evident within their school.

Performative

The school leader stated that they organized training days for the teaching domains where data use was a subject. Furthermore, he stated that management is mainly focused on the most basic data and data use is not or sparsely a returning topic with management.

The team leader stated that data use is hardly a topic of discussion during team meetings. Mainly, this consists of looking at and comparing their educational results within and between domain groups, on a yearly basis.

The data team members stated that the school is currently still working with the data team intervention, that is in the last phase of the eight-step cycle. In that sense the data team intervention has been a part of the school. Furthermore, the domains mathematics and ICT use the intervention to research specific topics approximately three times a year. The consensus is that overall it is not structured in daily practice. The teachers stated that their team leader does use data during meetings and that data is used for educational improvement during team meetings. In the trainer's logs of school B was mentioned that the colleagues in the school viewed data use as self-evident.

intervention adapted to needs school

The school leader stated that the school will continue with data team intervention for the domains in VMBO. They intend to use data to make improvements to their education. The team leader did not confirm this entirely. He stated that there are currently no more data teams active, also because facilitation has stopped, and the intervention is considered time intensive. Furthermore, the original data team did not evaluate their endeavor as they had agreed upon. If he would use the data team intervention again he would compromise and shorten it.

The data team members stated that the intervention they used has been compromised in some degree. Mainly, the technical part of research, the verifying of data and the hypotheses was partially done.

The logs confirmed that data team members tend to skip steps to get to suitable measures for their educational problem, including the team leader. Furthermore, they mentioned the start of two new data teams in the upcoming year.

Improvement education

The school leader and the team leader stated that in their opinion the school does not use data enough for improving educational practice. There are initiatives, and they do talk about it, but it is not a '*way of life'*. More importantly, they stated that the results of the data team were hardly used to implement measures. But they do think that the data team intervention caused a shift towards data use in the discussion inside the school.

The team leader stated that the school did use their educational quality assurance manager in multiple areas for yearly data, like the prognoses and results of the educational tracks as input for improvement. Additionally, the intervention led to the school trying to improve their own activities, instead of looking for a cause outside the school.

The data team members stated that data use for educational improvement is part of daily practice as it was before the data team intervention. Teachers look at the grades, attendance, and homework of their pupils and act upon it. In addition, the school did use study days to look at results per domain with a more concise variant of the data team intervention. One of the data team members stated that he does notice that colleagues of the domain mathematics do look at data more often and that he still looks at the former goal of the data team intervention at the end of the year. Furthermore, both data team members stated that the implementations that followed the data team intervention are still in place. However, after a year and a half of researching how to improve the new HAVO GT management stopped the initiative. The presented findings were dismissed completely by management.

The teachers stated that they are more aware of the way they differentiate in their classes because of the data team intervention. Furthermore, they thought that data use for improving educational practice is present through team meetings where they look at data such as yearly grades, but not frequently present. In addition, the colleagues stated that the school is always trying to improve educational practice, but that it is often unclear for them why the initiative started.
In the trainer's logs of school B there was extensively mentioned that the goal of data team was to improve educational performance, more specifically how to improve the yield of the HAVO-GT class at the end of the first two years of education.

Improvement data use

The school leader thought that people in education feel personally attacked by findings and that this is a reason for management to refute the findings of the data team. Furthermore, the school leader stated the sector VMBO still believes in the data team intervention, but not every sector leader is equally enthusiastic about this. He stated that upper management still want to transform towards a more data use oriented education away from the penalization culture. The school leader concludes that they are on the right path and improve data use step by step towards '*data use as a way of life'*.

The team leader stated that he noticed that data use is not imbedded in education. Colleagues often come to them with an idea, but without the support of data. He did notice a difference between colleagues and former data team members in this regard and thus some learning effect took place.

The data team members stated that one added value of the data team intervention is that they and the team where the measures were implemented now search for the cause of a problem and a foundation for their opinion. However, they think that teachers' opinions on data use still differ a lot from each other, some are not convinced of the value. One big advantage that they mentioned is that there is now more discussion on the processes and the assumptions.

The logs of school B showed multiple times that learning how to use data and the intervention is a goal of this data team, this was emphasized by their team leader: '*We will work very structured to learn how we need to conduct research within our school*.' In addition, learning moments of the data team were mentioned, such as: '*They do state that they have less knowledge on qualitative research but would like to learn this*.'

4.2 Knowledge Sharing

4.2.1 Knowledge sharing School Board

Reciprocity

No mention of reciprocity was made by the respondent.

Centralization

The board member stated that he thinks that the knowledge from the data team intervention will leave the school with the former data team members. He stated that it is very difficult to secure specific knowledge within a school.

Knowledge sharing data use

The board member stated that he thinks that knowledge sharing on the data team intervention did happen during conferences and scheduled return days for data team members.

Knowledge sharing educational problem

No mention of forward knowledge sharing of the educational problem was made by the respondent.

4.2.2 Knowledge Sharing School A

Reciprocity

The team leader stated that she thinks that the school board did take intrinsic involvement as a factor when selecting the data team members. She stated that she thinks that she was most involved as a school leader and that the school board was little involved during the process, except for the educational quality assurance manager, who was almost always present.

The data team members stated that reciprocity in general is high in their school. All colleagues are involved in each other's problems and help each other. The educational quality assurance manager present confirmed this when comparing this school to others she works for. Furthermore, everyone in the data team was involved in the process and every member put in the same amount of work, but the team leader in the data team had the final responsibility that the lessons.

The teachers stated that they would typify their school as a '*cooperation school*', just as the data team members and the educational quality assurance manager. The teachers form a close team and the majority is enthusiastic and works for the goals of the school. The teachers within the concerning team whom where the most involved are the data team members and the colleagues who need to carry out the measures. They do note that there are other colleagues that showed interest and wanted to be informed on what the data team does.

The trainers' logs showed that the cooperation and atmosphere at the start were low, members did not show a lot of enthusiasm or initiative. After the first few meetings the data team members were all really involved, except for one member, who regularly turned up late and responded nonchalant. All members contributed during the meetings, participating actively in discussions, and in the preparation with the gathering and processing of data. Towards the end, when constructing measures, the team leader and another member somewhat carried the team with their due diligence.

Centralization

The team leader stated that she had the final responsibility. And that X. usually took on the

responsibility to communicate the findings and process of the data team to the other colleagues. For implementing the measures, they selected three colleagues from specific domains. Two of the colleagues were part of the data team and one was not. Furthermore, she stated that on occasion she had to guide the team, but mostly she was a normal data team member and the group worked as a team. The data team had a shared responsibility when implementing the measures. Lastly, she thinks that knowledge on data use leaves the organization when one of the members leaves the school. The data team members confirm that X. and L. where mostly responsible for communication of both process and the educational problem to the colleagues. The educational quality assurance manager was mainly responsible for collecting all the data. The reason they give for this is that other data team members and colleagues do not have the same access, knowledge and skills for gathering and summarize data. When processing the data, the whole team was involved and divided all tasks. They stated that new colleagues do not get caught up in the data team intervention and therefor knowledge can leave the organization. The teachers received a document with the findings of the data team via the team leader. For implementing the measures, they stated that some of the colleagues from Mathematics, English, and Dutch got the domain counseling added to their job responsibilities.

The trainer's logs showed that at the start of the intervention there is a difference in knowledge and skills regarding data use, some members have experience in gathering, processing and visualizing data. However, all members do actively participate in the entire process of the intervention. Little knowledge on qualitative research was present in the team. The team leader had most knowledge on qualitative research due to her own study. For two data team members, when forming the conclusions and measures, the pace seems to high.

Knowledge sharing data use

The team leader did not comment specifically on the sharing of knowledge within the data team, but in a more general sense on cooperation, discussion within the team and task division. The data team members stated that the members prepared the meetings and discussed the steps of the intervention and the task division during the meeting. The teachers indirectly confirmed this by stating that cooperation in groups mostly run smoothly.

The trainer's logs of school A showed that members actively discuss the process of data use and correct each other: `*I don't think we should be doing this, first we need to figure out what our measures are going to be*.' Furthermore, the team leader asked a lot of questions on the process of data use and qualitative research.

Knowledge sharing educational problem

The team leader and the data team members stated that the educational problem was topic of discussion during the meetings. However, this was mainly part of how to continue in the process of the data team intervention.

The trainer's logs showed that the educational problem is sometimes discussed, for instance: '*The colleagues mainly state examples form practice: 'The phones distract the pupils.' This allows them to get to possible measures. H:'I think we can really use these!''*. Discussion of the educational problem is mostly a part of the discussion of the process, it is often used as input. Furthermore, often the information on the educational problem is input from the colleagues.

4.1.3 Knowledge Sharing School B

Reciprocity

The school leader stated that the team leader has the responsibility to answer to the management, but the team as a whole is responsible for the results. Sometimes, employees do not take ownership of their job and do not feel responsible.

The team leader stated that collaboration within the data team was very intensive between the two sectors HAVO and VMBO, even outside of the scheduled meetings. The team leader stated that everyone was equally involved in the process and that there was a fair distribution of tasks. The data team members stated that everyone had the same degree of involvement. Furthermore, they stated that including the team leader in the data team was helpful this ensured that he felt responsible for the result. They deemed the team leader the data team member with the final responsibility together with one data team member. The team also had an energy measurement which concluded that the colleagues feel very involved, thus there was unity within the team. The teachers stated that the colleagues in their team give a *'160 percent'*. But not all colleagues do that, some choose to partially work in another team, because they want something different on occasion.

The trainer's logs of school B showed that involvement and enthusiasm was high at the start of the project: '*cooperation in this data team is self-evident, structured and exists naturally*.' Everyone completes tasks as agreed upon. Towards forming conclusions and measures, the involvement and cooperation seemed lower, more input from the trainer is needed. All members and trainer stated during the evaluation that they were satisfied with the high involvement and cooperation of the data team. Noteworthy, the team had multiple changes in composition throughout the years.

Centralization

The school leader stated that he thinks that knowledge leaves the school with the person. In addition, he stated that this is the case regarding any topic random topic in education. However, the responsibility lies with all the colleagues to have knowledge on data use. And that an organization should never be built in the way that certain people are unmissable because of their knowledge or skills.

The team leader stated that mostly the two mathematics colleagues and the educational quality assurance manager focused on gathering and processing data. His own roll was that of chairman, when he was present. Those were the most distinctive roles. Furthermore, a teacher from the involved team and himself were mostly responsible for developing and implementing the measures. This was caused by the fact that the data team was done with research and finished the advice for the school.

The data team members stated that they were mostly involved when gathering and processing data, because they are mathematicians. Others such as X. and C. also were involved. This was caused by other data team members not having affinity with numbers and data. They did not find it a problem because those members focused more on the measures. The team focused task division on the qualities, availability and enthusiasm of the members. C. and K. were the ones to present the findings to the teacher team. Lastly, the data team members stated that they do think that knowledge leaves the organization with the people that possess it.

The teachers stated that they think that knowledge leaves the organization with the people that possess it.

The trainer's logs showed that one member was appointed secretary, this caused her input during the whole intervention to be lower and sometimes non-existing. The educational quality assurance manager had the most knowledge and access regarding data. Some team members join her during the gathering of data but state that they did not contribute: '*I have been watching full amazement. What a numbers and buttons.*' The two mathematicians in the team took on most of the analyzing, and visualizing data together with the educational quality assurance manager. The team has little knowledge of qualitative research. When drawing conclusions and forming measures the team leader and a team member find it difficult to base this on the data and often skip parts of the eight-step cycle.

Knowledge sharing data use

The team leader stated that the process was shared in the data team. They discussed parts that did not go well in the process. The data team members stated that they divided the tasks regarding the

steps of the intervention. They made sure to prepare it and inform the other data team members. Also, during the meetings, they made sure that the entire team was well informed on what the step involved. They referred to the data team intervention book that they received as much as possible. The trainer's logs showed that the team discussed the process of the intervention, for instance: '*The provided overview is not directly accepted as correct, the members critically review it. G. notes something about the calculations of percentages: 'Should those groups not be calculated separately?*" Furthermore, the team extensively discussed qualitative research before starting interviews and after they gathered the data on how to proceed. The conclusions per theme per duo are formed in different ways. The team discussed the process during most or all steps of the cycle.

Knowledge sharing educational problem

The team leader stated that sharing of knowledge on both the process and the educational problem mostly happened verbal, sometimes via a presentation, during the scheduled meetings.
The data team members stated that they prepared the meetings and shared information during the scheduled meetings.

The trainer's logs showed that discussion of the educational problem is mostly part when discussing how to continue in the process, for instance: '*But we still do not know why all those pupils score insufficient after P2. We need to continue with the research.*' Furthermore, the team discussed the educational problem after implementation of the measures during evaluation.

4.3 Knowledge Brokerage

4.3.1 Knowledge Brokerage School Board

Outward knowledge brokerage data team intervention and educational problem

The board member stated that the board organized return days for data teams. Which offered the opportunity for the data teams to present their process. These days focused on exchanging experiences with the intervention and process on their schools with other data teams. Furthermore, he stated that the board received information from the data teams during return and similar days and is now very familiar with the data team intervention. Additionally, multiple newsletters and magazines were used for the data team intervention.

Inward knowledge brokerage data team intervention and educational problem

No mention of inward knowledge brokerage data team intervention and the educational problem was made by the respondent.

Forward knowledge brokerage data team intervention and educational problem

No mention of forward knowledge brokerage of the data team intervention and the educational problem was made by the respondent.

4.3.2 Knowledge Brokerage School A

Outward knowledge brokerage data team intervention

The team leader stated that mainly X. and herself communicated both the findings and the process of the data team to the colleagues in the involved team. The team leader was responsible for informing the school leaders on the progressions of the data team. The data team used the team meetings as a moment to present the process. They used the explanation of the process as clarification for the findings and the measures. They intentionally did not spread it to the entire teacher team but kept it within the team that was concerned with the educational problem. The team leader was responsible for communicating the process of the data team to school board. She stated that sharing in an informal way was most likely focused around educational problems and not the process of the data team intervention.

The data team members confirmed the statement of the team leader that the data team used the teacher's team meetings to share the process of the data team intervention. And that X. was the person responsible for sharing this with the specific team.

The teachers, both employed at the school for a year and a half, thus after the project, were not up to date on how the data team shared the process with the specific team. They did state that they view the data team as 'the brains' and the teacher team as the implementing party and thus the cooperation small. However, both the colleagues have a document which contains the evaluation of the data team on the implemented measures, who was involved and what the results were. The eight steps of the cycle they were not aware of.

The trainer's logs showed that a short presentation of the data team intervention was held in the involved teacher team in the phase of forming hypotheses. The trainer's logs showed that when formulating the measures, the team shared their findings with the teacher team through a group discussion.

Outward knowledge brokerage educational problem

The team leader stated that the data team informed the specific team on the developments. But there was no real interconnectedness between the data team and the teacher team, because the data team did the cycle and the teacher team implemented the measures. The team leader was also responsible for communicating the findings to the other school leaders. Furthermore, she stated that the final document with findings was shared with the specific teacher team in a meeting, and

only with that team.

The data team members confirm that they shared the findings with the teacher team during team meetings, where multiple members of the data team were present. They further stated that other teacher teams that were not directly involved probably could have gotten some information on the results via bulletins from the school leaders. The main interest of the meetings with colleagues was on the educational problem. They thought that especially the results from the data team were most likely shared in an informal manner and discussed during assessment interview of pupils.

The teachers stated that they were informed on the implemented measures of the data team and received the evaluation document of the data team with the findings. Communication ended with asking and providing information on the educational problem. Furthermore, the teachers stated that the team leader and the data team both shared information on the educational problem with all the directly involved colleagues. Additionally, they communicated the findings to entire teacher team to receive input from these colleagues. The results were discussed based on the document they received from the team leader. The teachers complimented the document as being understandable, concise and clearly written. The trainer's logs confirmed that when formulating the measures, the team shared their findings with the teacher team through a group discussion.

Inward knowledge brokerage data team intervention

The team leader stated that the whole data team was approachable for the school leaders. However, they did not use other paths than the team leader. The data team members stated that they almost never got approached with questions from without the data team. Questions did occur when the conversation already started. A reason they give is that others were not as involved in the data team intervention as they were. If the data team did get questions from colleagues, they were able to answer them or tried to come back later with an answer. This included questions on the process of the data team. Colleagues did express interest in the data team, but there was no real interconnectedness. The trainer's logs showed no inward knowledge brokerage of the data team intervention.

Inward knowledge brokerage educational problem

The team leader stated that the enthusiasm of the data team members made other colleagues curious, which started conversations in and with the teacher team. The data team members stated that they did receive help from for instance a mathematics teacher that provided information about pupils and the implemented measures. They received positive reactions from the teacher team.

However, spontaneous asking of questions did hardly ever occur.

One of the teachers approached the data team regularly with questions because he was involved in implementing the measures. The other teacher, whom was not directly involved, stated that he probably does not know who the data team members are.

The trainer's logs of school A showed that colleagues enthusiastically wanted to contribute to forming the hypotheses. Furthermore, the teacher team contributed when forming the measures. However, it is noted that there was little input from the teacher team on this topic.

Forward knowledge brokerage data team intervention and educational problem

No mention of forward knowledge was made by the respondents. Nor did the trainer's logs mentioned forward knowledge brokerage.

4.1.3 Knowledge Brokerage School B

Outward knowledge brokerage data team intervention

The school leader stated that the data team brokered knowledge via team meetings, and a school magazine. The school leader stated that he thinks that this brokerage included a lot of general information. Furthermore, he stated that he thinks that the magazine is not an effective path for brokering knowledge to colleagues. In his opinion the data team should come with a complete report for the entire school. There were also rapports in between for the management that were focused on the process of the data team. The team leader stated that the data team at least brokered knowledge to the involved teacher team and management of sections and once to the school board and that he was mostly the one to broker this knowledge.

The data team members stated that the team explicitly agreed upon to update the teacher team via reports during the process. However, they did note that these reports were only for a small part focused on the specific data team intervention process, but more general on what steps the data team took. During study days, C. and K. brokered the process to the colleagues and they partially used the steps of the intervention for a case study. Furthermore, they stated that when management decides an intervention needs to happen the sections will include this to some of their meetings.

The teachers stated that the school's management shared the process of the data team intervention during a plenary meeting with all colleagues. They thought that this was during a study day. Furthermore, the teachers stated that they consider communication as an important way to promote the intervention. And the fact that they know so little about the data team intervention might be contributed to them or to the communication of the data team. According to the teachers no informal knowledge brokerage took place, nor do they know what the process of the data team

intervention was.

The trainer's logs of school B showed that the team leader and educational quality assurance manager communicated the process to the colleagues via personnel info and the newsletter. Confirming the interview statements, the logs showed that the team leader presented the data team intervention to the school board.

Outward knowledge brokerage educational problem

The school leader stated that the intended educational result was not reached nor brokered to the colleagues. The team leader stated that the data team systematically informed the involved teacher team on the end report, progress, findings, and measures during team meetings and that the results also were part of discussion during lunch breaks. The team leader stated that he brokered knowledge on the educational problem to management and the school board. In addition, the team leader took the opportunity to broker positive educational results to both the colleagues and the management. Furthermore, he sometimes personally invited colleagues to help them with an educational problem.

The data team members stated knowledge on the educational problem was brokered to the involved colleagues during team meetings and via a school magazine and that the data team members willing to do this were made responsible for the communication, this was mostly done by Q. and P. During these meetings data team members also refuted assumptions of colleagues with findings.

The teachers stated that they once were presented with the findings from the data team and did not receive information from the data team frequently. They did think that the results were mentioned during team meetings, but their team leader did not explicitly state the findings of the data team. The teachers also stated that they are not the people that find numbers and graphs interesting. They stated that they would prefer the actual data team members to present the findings instead of team leaders or management because the data team members teach classes, like them. Furthermore, the teachers stated that they consider communication as an important way to promote the intervention. And the fact that they know so little about the data team intervention might be contributed to them or to the communication of the data team.

Inward knowledge brokerage data team intervention

The school leader stated that the data team was more likely to broker knowledge when this was requested from outside of the team. The team leader stated that sometimes he did get approached by colleagues, after his initiation. The data team members stated that they did get approached by

colleagues, but that they were not that interested in the process of the data team intervention. The teachers stated that they did not approach the data team, but in hindsight perhaps should have. The trainer's logs of school B showed no inward knowledge brokerage of the data team intervention.

Inward knowledge brokerage educational problem

The school leader stated that he did approach the data team for specific information, such as improvement plans and domain specific data. Furthermore, he approached the data team mainly about the results because from his management position he could follow the process. He asked questions during and after the eight-step cycle. This brokerage mostly happened via the team leader of the data teams. The team leader stated that he mostly received questions from colleagues to help with an educational problem after he initiated the contact. The data team members stated that they did get approached by colleagues; '*how can we use your findings in the classroom.*' During team meetings they also received questions on their findings, which gave cause for interesting discussions. The trainer's logs of school B showed that the colleagues provided the data team with a long list of hypotheses for the educational problem.

Forward knowledge brokerage data team intervention and educational problem

No mention of forward knowledge brokerage was made by the respondents. In addition, the trainer's logs showed no forward knowledge brokerage.

5. Conclusion and Discussion

In this chapter the conclusions related to the research question and sub questions are presented. The findings will be discussed in relation to the literature.

5.1. Sustainability of data use

On an organizational level the data team intervention, improvement of educational practice and data use is documented in the strategic policy of the school board. In addition, validated data use for improving educational quality and school practice did develop and involved personnel learned from the data team intervention. Concluding that, on an organizational level data use is present in ostensive and performative aspects of sustainability. The school board promotes and facilitated data use for the data teams and uses data as a means for the development of the organization and its educational results.

The data team intervention does not get specifically mentioned in the documentation of school A. The strategic document of the school does mention multiple sources of data are used to improve education and as input for staff meetings. However, there is disagreement among different

layers within the organization on what is documented where. This suggests that at an ostensive level there is room for improvement to further sustainability of data use in school A.

Data use is a frequently returning topic in teacher and board meetings in school A. All levels within the school confirm that data is often used for improving educational practice and more specifically moving towards personalized education. There is consensus that the data team intervention is no longer in practice within the school, but the implemented measures and their results still get monitored. Improving data use within the school is present through a shift towards an evidence-based decision-making mindset according to the team leader and data team members. Furthermore, the data team members improved their data use skills during the intervention and the teachers were well informed on the progress of the data team. Concluding that school A achieved a high level of sustained data use in practice throughout the different levels in the organization, with room for improvement on documentation or ostensive aspect.

The strategic policy document of school B and the school guide both mention data use for educational improvement extensively and are specific. However, data use is not well structured into daily practice as 'a way of life' nor has there been much improvement since the intervention. Data use is present in quarterly and yearly meetings on educational results.

Improving data use is taking small steps in the right direction. The original data team did not evaluate their measurements and results properly. Furthermore, the results of the data team were dismissed by management and data use is no longer facilitated by the school leader.

Concluding that the ostensive aspect of sustainability is well covered in school B. However, there is the consensus throughout the levels of the school that there was not much improvement in their data use for educational practice. The data team seems to not have finished their process and feels dismissed by management. Overall data use in school B shows little sustainability, despite small improvements.

In conclusion, school A has room for improving the documentation to increase sustainability. School B is more concise and clearer in the ostensive aspect. However, in practice, school A sustained data use more clearly than school B. All levels in school A agreed upon how data use is prevalent in daily practice and its importance. School A improves data use skills and educational practice through data use. Furthermore, the school leaders and data team had clear ideas how data use can maintain and improve as a part of their school. The different organizational levels in school B did not agree on how data use is part of their daily practice. It can be concluded that there is little improvement since the data team intervention. The data team did not feel well supported and it is unclear in what manner the school plans to improve data use in the future. These findings show that

school A sustained data use more clearly than school B, especially in terms of performative, adapted to needs school, and improvement data use and educational practice.

5.2. Knowledge Sharing

Reciprocity in the data team of school A seems high throughout the process for all data team members, except one. Workload was divided evenly, but the team needed to be motivated at the start of the intervention. Centralization is low because all members were involved in all aspects of the intervention. The team ensured that all data team members developed skills for data use for all steps of the data team intervention.

Both knowledge sharing on data use and the educational problem took place during the team meetings. Concluding that the data team of school A put effort in sharing knowledge with all the data team members and attempting to increase the complete skill set for data use in all data team members.

In school B all data team members are equally involved throughout the process and that task division was fair. Concluding that the data team had a high measure of reciprocity. The team divided the tasks based on current skillsets of the data team members, this resulted in fragmentation of skills through the data team. This suggest that knowledge on how to use data is more likely to be found with certain members of the data team, resulting in a higher centralization.
Within the data team of school B it was custom to share knowledge on process and educational problem during meetings. The team ensured that all members were informed on the completed tasks.

5.3. Knowledge Brokerage

The school board organized return days for data teams as encouragement to broker and share knowledge outside the school. The school board only received information directly from data teams during similar days. The board also did not approach the data teams for information.
The data team of school A brokered knowledge mainly on the educational findings to the management and the involved teacher team. This information was shared during meetings and through a final document summarizing the findings and results of the data team. This leads to the conclusion that the knowledge brokerage of the data team led to a well-informed teacher team regarding the results and functionality of data use for improving educational practice.
Inward knowledge brokerage did not happen often and only with incentive, by both management and teachers.

The data team of school B used reports, magazines and study days to inform all teachers and management. Overall, management and teachers seemed informed to a low extent on the results,

measures and data use. Concluding that knowledge on data use and the educational problem was brokered to management and the teachers to some degree, but seemingly ineffective.
The data team was not approached on the topic of data use, and little on the educational problem. This only occurred during set meetings.

5.4. The relation between Knowledge Sharing and Brokerage, and with Sustainability

Relation Knowledge Sharing and Sustainability

The main difference found in knowledge sharing in the data teams of the two schools lies in the centrality of knowledge. School A appeared to have a relatively lower centrality. The difference in centrality could have been the influencing factor on capacity building for sustained data use. This can be explained by the manner the teams divided tasks. The data team of school A ensured that all members participated and developed skills and knowledge for all steps in the cycle of the data team intervention. In school B there was a clear preference to assign certain tasks, like processing data, to specific data team members. Reciprocity in both teams seemed similar. Members were overall eager to work with the data team intervention and divided tasks evenly, with some exceptions over time. However, the current study did not measure the density of the involved data teams. Density represents the strength of the social ties and unity within the group, which in turn affects the performance of a team (Balkundi & Harrison, 2006). Thus, density of the social ties in the data teams could have been a valuable addition providing more insight in the functioning of the data teams and the relation knowledge sharing has with sustainability of data use.

Both teams did actively share knowledge to their members on the individual and team progress made on the educational problem and the process of data use. The data team of school A was more eager to ensure that all data team members could apply the shared knowledge. Where the current study showed similar knowledge sharing activities, Hubers, et al. (2018) found that knowledge sharing structures and activity within teams differed extensively and that knowledge sharing needed more explicit attention. Therefore, the current findings suggest that an important promoting factor for sustainability of data use is the centrality of specific data use knowledge and skills within the data team members, more so than the knowledge sharing activity.

Relation Knowledge Brokerage and Sustainability

The main difference found in knowledge brokerage by the data teams in both schools is the brokerage of knowledge on the educational problem. Overall, outward knowledge brokerage did not occur often in both schools, inward knowledge brokerage even less and forward knowledge brokerage not at all, making it a difficult subject to draw conclusions on. The low rates of knowledge

brokerage are similar to the findings of Keuning, et al. (2016) and Hubers, et al. (2018). In addition, the current study found that knowledge brokerage mainly occurred on the topic of the educational problem. This, study found a difference between the outward knowledge brokerage of the data teams. School A seemed to more intently broker knowledge to the management and to the involved teacher teams. As described by Finnigan and Daly (2012), it is more likely that in the later phases of an intervention knowledge brokerage starts to play a more significant role, since results of the intervention can be brokered. In this regard, an important difference is that the data team in school A shared an extensive document on their findings, procedures and measures with the stakeholders. School B did not make such an effort in the final stages of the intervention but did broker knowledge during the data team intervention process to the entire school and management. The results show that the employees of school A were better informed on what the data team did, what they achieved and how data use is prevalent in the school. This suggest that a report regarding the findings, procedures and measures of the intervention is a good tool to broker knowledge beyond the data team and further capacity for data use within the school.

In conclusion, this study aimed to find a link between knowledge sharing and brokerage and the sustainability in data use in schools that participated in the data team intervention. It is concluded that data use is sustained better in school A in terms of performative routines, adapted to needs school, and improvement data use and educational practice. School B performed better on ostensive routines. The finding of a higher degree of sustainable data use in school A is supported by the findings of a higher degree of knowledge sharing and brokerage. School A had a lower degree of centrality within the data team, which has been reported to lead to more capacity for sustainability. In addition, outward knowledge brokerage appeared to be better in school A, further supporting the higher degree of sustained data use. These findings suggest that knowledge sharing and brokerage seemed to have influenced the sustainability of data use.

5.5. Limitations and Recommendations

Limitations and recommendations future research

Some limitations must be considered when interpreting this study and its findings.

Multiple limitations emerge when conducting research through interviews. For this study the interviewees were theoretically selected because a representation of the five layers within the organization was needed to get a full view of the sustained data use and its influencing factors. In doing so the selection process may have resulted in interviewees in a school that were more positive or negative compared to the other. Furthermore, the interviews where held in two schools in the same district with a small number of interviewees. In addition to the sampling, the interviews were conducted by three different interviewers, mostly in pairs. These interviewers had different levels of

expertise in conducting interviews, this could have influenced the data gathered through the interviews. For instance, by a different tendency in follow up questions, or the steering of interviewees in a desired direction. For future research on the effect of knowledge sharing and brokerage on the sustainability of data use it is advised to use a larger pool to gather data. It is suggested that future research does not only focus on the in-depth insight that this research tries to provide, but also provide a broader view. For instance, by using questionnaires to get a schoolwide understanding of in what degree data is sustained.

Another limitation to the present study is that it is part of a larger study. This resulted in the interviews being on multiple topics in addition to sustainability, knowledge sharing and knowledge brokerage. For instance, leadership was an important construct that was included. This caused this study to have limited time during the interview for questions, mainly for the constructs knowledge sharing and brokerage. This limitation could have led to an incomplete picture of knowledge sharing and brokerage by the data team. Which in turn can distort the findings and influence the conclusion. For future research it is advised that knowledge sharing and knowledge brokerage is more in-depth and broader investigated since this study and other literature concluded that knowledge sharing and brokerage implies to have an effect on capacity building within the organization and consequentially on sustainability of data use.

A final limitation worth mentioning is that the findings cannot be extended beyond the scope of this study. The current study aimed to give a detailed description, based on the opinion and perception of the interviewees. These results might only apply to this specific population (Atieno, 2009). Thus, making it difficult to transfer the conclusion of a qualitative study to a larger population.

Recommendations for practice

The findings of this study suggest that centrality seems to be the main knowledge sharing factor influencing the sustainability of data use. Therefore, it is advised for future interventions to ensure that the whole data team can perform the steps or cycle from the intervention to minimize centralization of knowledge and skills within the team or specific persons.

Within knowledge brokerage the main difference that appeared to influence sustainable data use were their efforts for knowledge dissemination towards the involved teacher team. School A also included a well prepared and well written document with all the findings, measurements, and results of the data team in their knowledge brokerage to the other stakeholders. Therefore, it is advised to ensure deliberate brokering of knowledge to primary stakeholders and that clear documentation of the team's intervention and findings can be a powerful tool in doing so.

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Appendices

Appendix A. Interview scheme Schoolboard

factoren	**dimensies**	**vraag**
Duurzaamheid	Definitie dzh volgens respondent	Wanneer vind jij dat een onderwijsinnovatie duurzaam is?
Duurzaamheid interventie	Blijvende implementatie + fidelity Scaling up flexibility Duurzaamheid resultaat	Wanneer vind jij dat *de datateam methode* duurzaam is? (Kun je iets vertellen over hoe het proces is gegaan nadat de begeleiding van het datateam is gestopt? (dus: hoe bewust zijn keuzes gemaakt)) Doorvragen op: a. Wordt er op scholen binnen de SCC nog gewerkt met de datateam methode? Zo ja: Hoe precies ? (denk ook aan schaalvergroting) De maatregelen waren xxxx: a. Hebben jullie zicht op of de geïnitieerde maatregelen ook daadwerkelijk geïmplementeerd? b. En geëvalueerd? c. Zijn de onderwijskundig problemen van destijds opgelost? d. Zijn de resultaten blijvend verbeterd?
Ostensief en performatief gebruik & routines	Dagelijkse (school)routine datagebruik	Wordt data gebruikt binnen de SCC? Waarvoor? Wanneer? Waar? Ook buiten de organisatie? Doorvragen op: • Kun je een voorbeeld geven van hoe data wordt gebruikt in de organisatie? (routines?) • Wordt de manier van werken met data of volgens de datateammethode ergens genoemd koersdocument • Zijn er gesprekken of vergaderingen met scholen op basis van data? (routines?)
Collaboration	Cultuur samenwerken binnen en buiten het team collegialiteit	Hoe omschrijf je de samenwerking met de scholen? Hoe omschrijf je de samenwerking tussen de scholen?
Knowledge brokerage	Wederkerigheid Centralisatie kennisdeling	Op welke manier werd kennis gedeeld vanuit de verschillende datateams of verschillende scholen? Doorvragen op: - Welke personen waren daarbij betrokken? - Welk medium werd gebruikt? (denk aan nieuwsbrief, studiedag) Hebben jullie weleens vragen gesteld aan datateamleden? - Doorvragen op procedure en inhoud

Appendix B. Interview scheme school- and teamleader

factoren	**dimensies**	**vraag**
Duurzaamheid	Definitie dzh volgens respondent	Wanneer vind jij dat een onderwijsinnovatie duurzaam is?
Duurzaamheid interventie	Blijvende implementatie + fidelity Scaling up flexibility Duurzaamheid resultaat	Wanneer vind jij dat de *datateam methode* duurzaam is? (Kun je iets vertellen over hoe het proces is gegaan nadat de begeleiding van het datateam is gestopt? (dus: hoe bewust zijn keuzes gemaakt)) Doorvragen op: b. Wordt er nog gewerkt met de datateam methode? Zo ja: Hoe precies ? (denk ook aan schaalvergroting) c. Wordt de datateam methode nog steeds in de originele opzet volgens de 8 stappen gebruikt. (Indien aangepast: waarom? d. Is dit aangepast aan andere processen binnen de school? Jullie gevonden maatregelen waren: xxx e. Zijn de geïnitieerde maatregelen ook daadwerkelijk geïmplementeerd? f. En geëvalueerd? g. Is het onderwijskundig probleem van destijds opgelost? h. Zijn de resultaten blijvend verbeterd?
Ostensief en performatief gebruik & routines	Dagelijkse (school)routine datagebruik	Wordt data gebruikt in de school? Waarvoor? Wanneer? Waar? Ook buiten de organisatie? Doorvragen op: • Kun je een voorbeeld geven van hoe data wordt gebruikt in de organisatie? (routines?) • Wordt de manier van werken met data of volgens de datateammethode ergens genoemd in een mjb/ teamplan/ vakplan? • Zijn er gesprekken of vergaderingen met secties/ individuen/ bestuur/ teamleiders op basis van data? (routines?)
Collaboration	Cultuur samenwerken binnen en buiten het team collegialiteit	Hoe omschrijf je de samenwerking binnen de school (collega's, locaties, sl-team) Heb je het gevoel dat je in een team werkt binnen de school, of dat je vooral veel individueel werkt?
Knowledge brokerage	Buitenwaarts-binnenwaartse en voorwaartse bemiddeling	Op welke manier is kennis gedeeld vanuit het datateam? Doorvragen op: - welke personen waren erbij betrokken? - Via welk medium (nieuwsbrief, teambespreking, studiedag) Heb je weleens vragen gesteld aan leden van het datateam? - Doorvragen op procedure en inhoud

Appendix C. Interview scheme Data team member

Factoren/ construct	dimensies	vraag
duurzaamheid	Definitie dzh volgens respondent	Wanneer vind jij dat een onderwijsinnovatie duurzaam is?
Duurzaamheid interventie	Blijvende implementatie + fidelity Scaling up Flexibility Duurzaamheid resultaat	Wanneer vind jij dat de *datateam methode* duurzaam is? (Kun je iets vertellen over hoe het proces is gegaan nadat de begeleiding van het datateam is gestopt? (dus: hoe bewust zijn keuzes gemaakt)) Doorvragen op: e. Wordt er nog gewerkt met de datateam methode? Zo ja: Hoe precies ? (denk ook aan schaalvergroting) f. Wordt de datateam methode nog steeds in de originele opzet volgens de 8 stappen gebruikt. (Indien aangepast: waarom? g. Is dit aangepast aan andere processen binnen de school? Jullie gevonden maatregelen waren: xxx a. Zijn de geïnitieerde maatregelen ook daadwerkelijk geïmplementeerd? b. En geëvalueerd? c. Is het onderwijskundig probleem van destijds opgelost? d. Zijn de resultaten blijvend verbeterd?
Ostensief en performatief gebruik & routines	Dagelijkse schoolroutine Datagebruik	Wordt data gebruikt in de school? Waarvoor precies? En wanneer? Waar? Doorvragen op: a. Kun je een voorbeeld geven van hoe data wordt gebruikt in de organisatie? (routines?) b. Wordt de manier van werken met data of volgens de datateammethode ergens genoemd in een mjb/ teamplan/ vakplan? c. Zijn er gesprekken of vergaderingen met secties/ individuen/ teamleiders op basis van data?
Collaboration	Cultuur samenwerken binnen en buiten het team collegialiteit	Hoe omschrijf je de samenwerking • binnen het datateam • tussen het datateam en het team waar de maatregelen werden geïmplementeerd • binnen de school (collega's, locaties). Heb je het gevoel dat je in een team werkt binnen de school, of dat je vooral veel individueel werkt?
Knowledge sharing	Wederkerigheid Centralisatie Kennisdeling	Hoe verliep een gemiddelde bijeenkomst van het datateam? Was iedereen even betrokken? Doorvragen op - rolverdeling - focus op proces of focus op probleem
Knowledge brokerage		Op welke manier is kennis gedeeld vanuit het datateam?

		Doorvragen op: - welke personen waren erbij betrokken? - Via welk medium (nieuwsbrief, teambespreking, studiedag) Zijn jullie als datateamlid weleens benaderd voor het stellen van vragen? (over werkwijze of inhoudelijk)

Appendix D. Interview scheme teacher

factoren	dimensies	vraag
duurzaamheid	Definitie dzh volgens respondent	Wanneer vind jij dat een onderwijsinnovatie duurzaam is?
Duurzaamheid interventie	Blijvende implementatie + fidelity Scaling up flexibility Duurzaamheid resultaat	Wanneer vind jij dat de *datateam methode* duurzaam is? (Kun je iets vertellen over hoe het proces is gegaan nadat de begeleiding van het datateam is gestopt? (dus: hoe bewust zijn keuzes gemaakt)) Doorvragen op: h. Wordt er nog gewerkt met de datateam methode? Zo ja: Hoe precies ? (denk ook aan schaalvergroting) i. Wordt de datateam methode nog steeds in de originele opzet volgens de 8 stappen gebruikt. (Indien aangepast: waarom? j. Is dit aangepast aan andere processen binnen de school? Jullie gevonden maatregelen waren: xxx e. Zijn de geïnitieerde maatregelen ook daadwerkelijk geïmplementeerd? f. En geëvalueerd? g. Is het onderwijskundig probleem van destijds opgelost? h. Zijn de resultaten blijvend verbeterd?
ostensief en performatief gebruik & routines	Dagelijkse schoolroutine datagebruik	Wordt data gebruikt in de school? Waarvoor precies? En wanneer? Waar? Doorvragen op: d. Kun je een voorbeeld geven van hoe data wordt gebruikt in de organisatie? (routines?) e. Wordt de manier van werken met data of volgens de datateammethode ergens genoemd in een mjb/ teamplan/ vakplan? f. Zijn er gesprekken of vergaderingen met secties/ individuen/ bestuur/ teamleiders op basis van data?
Collaboration	Cultuur samenwerken binnen en buiten het team collegialiteit	Hoe omschrijf je de samenwerking • binnen het binnen het team waar de maatregelen werden geïmplementeerd • tussen het datateam en het team waar de maatregelen werden geïmplementeerd • binnen de school (collega's, locaties) Heb je het gevoel dat je in een team werkt binnen de school, of dat je vooral veel individueel werkt?
Knowledge brokerage		Op welke manier is kennis gedeeld vanuit het datateam? Doorvragen op: - welke personen waren erbij betrokken? - Via welk medium (nieuwsbrief, teambespreking, studiedag)

		Hebben jullie weleens vragen gesteld aan leden van het datateam? (over werkwijze of inhoudelijk)
Effectiviteit interventie		Wat vind je van de effectiviteit van de datateam methode? Wat vind je van de efficiëntie van de datateam methode?

Appendix E. consent form ethics commission

Gedragswetenschappen

COMMISSIE ETHIEK (CE) FACULTEIT GEDRAGSWETENSCHAPPEN
AANVRAAGFORMULIER BEOORDELING
VOORGENOMEN ONDERZOEK DOOR CE, VERSIE 2

1. Achtergrond proefpersonen

1. Betreft het een medisch-wetenschappelijk onderzoek?

NB: Medisch-wetenschappelijk onderzoek wordt in deze context gedefinieerd als 'onderzoek dat als doel heeft het beantwoorden van een vraag op het gebied van ziekte en gezondheid (etiologie, pathogenese, verschijnselen/symptomen, diagnose, preventie, uitkomst of behandeling van ziekte), door het op systematische wijze vergaren en bestuderen van gegevens. Het onderzoek beoogt bij te dragen aan medische kennis die ook geldend is voor populaties buiten de directe onderzoekspopulatie.'

Nee

2. Titel

2b. Datum van de aanvraag

21-03-2017

2a. Wat is de titel van het onderzoek (max. 50 tekens)?

LET OP: Als u van het SONA systeem gebruik gaat maken, moet hier dezelfde titel worden vermeld als de titel die in SONA zal worden gebruikt. Deze titel zal ook zichtbaar zijn voor de proefpersonen (bij gebruik SONA).

Duurzaamheid van onderwijsinnovaties

3. Contactgegevens onderzoekers/uitvoerders

3a. Voorletters

H.C.

3b. Achternaam

Prenger

3c. Vakgroep (indien van toepassing)

ELAN

3d. Medewerkernummer

76874569

3e. E-mailadres

h.c.prenger@utwente.nl

3f. Telefoonnummer (tijdens het onderzoek):

5627

3g. Indien er meer dan één uitvoerder is, dan graag in het onderstaande invulblok de gegevens (voorletters/achternaam/emailadres/ telefoonnummers) van alle uitvoerders van het onderzoek invullen.

Anne Tappel/ A.P.M..tappel@utwente.nl/ 1260
Tom Berendsen/ t.berendsen@student.utwente.nl
Marjolein Groenheijde/ m.e.groenheijde@student.utwente.nl

3h. Bent u gepromoveerd?

LET OP: Indien Nee: Geef bij vraag 4 de contactgegevens van de hoofdonderzoeker/begeleidend docent op.

J

4. Contactgegevens hoofdonderzoeker/begeleidend docent

LET OP: De eerst verantwoordelijke onderzoeker/begeleidend docent is verantwoordelijk voor de bij deze aanvraag verstrekte gegevens en het onderzoek als geheel en verleent (indien van toepassing) met de aanvraag in dit formulier toestemming aan ANDERE PERSO(O)N(EN) (zie vraag 3) om voornoemde onderzoek met proefpersonen uit te voeren.
Deze eerst verantwoordelijke onderzoeker is een gepromoveerde onderzoeker.

n.v.t.

5. Beoogde begin- en einddatum onderzoek

5a. Wat is de beoogde begindatum van het onderzoek?

10-04-2017

5b. Wat is de beoogde einddatum van het onderzoek?

01-01-2018

6. Doel en vraagstelling onderzoek

Geef een duidelijke en voldoende uitgebreide omschrijving van het onderzoek, waarmee een voldoende

ethische beoordeling mogelijk is.

6a. Wat is het doel van het onderzoek?

Het doel van het onderzoek is om inzicht te verkrijgen in de factoren die van invloed zijn op de duurzaamheid van onderwijsinnovaties . Hiervoor maken we gebruik van de datateam methode: een methode om docenten te ondersteunen data te gebruiken in het onderwijs om de kwaliteit van het onderwijs en leerlingresultaten te verbeteren. Duurzaamheid kan bepaald worden door in hoeverre het een organisatieroutine is geworden. Hierin kunnen ostensieve en performatieve aspecten worden onderscheiden. Om deze aspecten goed te kunnen onderzoeken, wordt er onderzoek uitgevoerd op vier verschillende niveaus binnen de organisatie: a) bestuursniveau, b) schoolleidingniveau (rector, sectordirecteur, teamleiders), c) docententeam niveau (rondom een groep leerlingen of een vak) en d) docentniveau.

6b. Wat is de vraagstelling van het onderzoek?

1. In hoeverre is datagebruik duurzaam vormgegeven op scholen waar gewerkt is met de datateam methode, op a) bestuursniveau, b) schoolleidingniveau (rector, sectordirecteur, teamleiders), c) docententeam niveau (rondom een groep leerlingen of een vak) en d) docentniveau.
2. 'Welke factoren zijn van invloed op het duurzaam vormgeven van datagebruik op scholen waar met de datateam methode is gewerkt op a) bestuursniveau, b) schoolleidingniveau, c) docententeam niveau en d) docentniveau?

7. Binnen welk kader wordt het onderzoek uitgevoerd?

7. Het onderzoek wordt uitgevoerd in het kader van een studie. Het gaat specifiek om een:

Promotie onderzoek

8. Aard van het onderzoek

8. Wat is de aard van het onderzoek?

(Online) survey onderzoek
Onderzoek d.m.v. interviews

9. Gebruik Proefpersonen uit SONA

9. Wilt u voor uw onderzoek met proefpersonen gebruik maken van SONA?

Nee

10. Omvang aantal sessies

Probeer een zo goed mogelijke schatting te geven van de benodigde duur van het onderzoek.
LET OP: Het onderzoek moet worden aangevraagd in eenheden van 15 minuten.
Proefpersooncredits worden toegekend per standaard eenheid van 15 minuten.

10a. Zal een proefpersoon zijn/haar deelname afronden in één of meerdere sessie(s)?

In meer dan een sessies

10b. Hoeveel sessies zijn in totaal nodig?

maximaal 2

10c. Wat is de duur (in minuten) van de afzonderlijke sessies?

maximaal 20 minuten vragenlijst, maximaal 45 minuten interview

10d. Wat is de totale duur van de sessie(s) in minuten?

maximaal 65 minuten

11. Beoogde aantal proefpersonen, verdeling, inclusie en exclusie criteria

11a. Wat is het beoogde aantal proefpersonen?

vragenlijst: ongeveer 5000 interviews: 70 personen

11b. Wat is de beoogde verdeling man/vrouw onder de proefpersonen?

50/50

11c. Wat zijn de beoogde inclusiecriteria?

- docenten
- teamleiders

- schoolleiders
- besturen
- voortgezet onderwijs
- school waar een datateam actief is (geweest) begeleid door Universiteit Twente

11d. Wat zijn de beoogde exclusiecriteria?

- onderwijsondersteunend personeel
- personeel facilitaire dienst

12. Procedure van het onderzoek

12. Wat moet een proefpersoon die aan dit onderzoek deelneemt doen?

Een duidelijke beschrijving van de procedure van het onderzoek (instructies aan de proefpersonen, te meten variabelen, condities, manipulaties, meetinstrumenten) is vereist.

De respondenten moeten een elektronische vragenlijst invullen van maximaal 20 minuten. Deze vragenlijst wordt via een link onder de beoogde respondenten verspreid door onze contactpersonen van iedere school (35 in totaal). De vragenlijst bevat items over het huidige datagebruik, en de huidige manier van werken rondom datagebruik (adhv datateam methode of niet). Daarnaast bevat de vragenlijst items over veronderstelde beinvloedende factoren, gebaseerd op de literatuur. Deze zijn oa samenwerking, kennisdeling, leiderschap, vertrouwen, motivatie en facilitering.
Na de vragenlijsten worden er 9 scholen van deze 35 geselecteerd, waar we verdiepende interviews gaan houden. Het gaat om 3 scholen met duurzaam datagebruik, 3 scholen waarin datagebruik niet duurzaam is gebleken, en 3 scholen die daar tussenin zitten. Van elk van deze scholen worden 7 à 8 personen geinterviewd: 1 bestuurder, 1 rector en/of 1 schoolleider, 2 teamleiders en 3 docenten. Het interview bevat verdiepende vragen over de manier van werken binnen de school, en de processen die onderliggen aan de verschillende veronderstelde beinvloedende factoren. Deze interviews worden op de scholen afgenomen, op een tijdstip in overeenstemming met de respondenten. De interviews duren maximaal 45 minuten en worden anoniem verwerkt.

13. Is een van de onderstaande situaties van toepassing?

n.v.t.

14. Mogelijke gevolgen van het onderzoek voor de proefpersonen.

14a. Kan het onderzoek mogelijk ongemak en/of risico's opleveren voor de proefpersonen?

Nee

14b. Toelichting

Indien Nee: Graag toelichten.
Indien Ja: Leg uit op welke wijze het ongemak en/of de risico's voor de deelnemende proefpersonen gerechtvaardigd worden in het licht van mogelijke opbrengsten van het onderzoek (voor de proefpersonen en/of andere groepen). Leg ook uit welke maatregelen worden getroffen om ongemak en risico's zoveel mogelijk op te vangen of te beperken.

De respondenten wordt gevraagd een vragenlijst in te vullen, en/ of een interview te geven. Dit geeft hooguit ongemak in de vorm van de tijd die ervoor vrijgemaakt moet worden. Maar het tijdstip wordt in overleg met de respondent bepaald, wat dit ongemak tot een minimum doet beperken. Geen fysieke ongemakken of risico's in elk geval. De resultaten worden anoniem verwerkt, en het gaat niet om een beoordeling.

15. Wilsbekwaamheid proefpersonen

Wilsbekwaamheid houdt in dat de proefpersonen beschikken over het individuele vermogen om zelfstandig beslissingen te nemen.
Proefpersonen zijn wilsbekwaam als zij:
•18 jaar of ouder (meerderjarig) zijn, en
•ieder voor zich in staat zijn tot een redelijke beoordeling van het eigen belang ter zake.
Volwassenen die daartoe niet in staat zijn, zijn wilsonbekwaam.(zie ook www.ccmo.nl/nl/onderzoek-bijwilsonbekwame-volwassenen)

15a. Zijn de proefpersonen wilsbekwaam?
Ja

16. Leeftijdscategorie

16. In welke leeftijdscategorie vallen de proefpersonen?
Meerderjarig: 18 jaar en ouder (alleen toestemming proefpersoon nodig)

17. Volledige voorlichting vooraf

17a. Worden proefpersonen (en/of ouders/verzorgers) alvorens zij meedoen aan het onderzoek volledig over doel en inhoud van het onderzoek voorgelicht, bijvoorbeeld door middel van een brochure?
Ja

17b. Toelichting
Indien Ja: op welke wijze?
Indien Nee: waarom niet?
Er wordt contact opgenomen met de contactpersonen van elke school. Deze ontvangen mondelinge en/ of schriftelijke informatie over het doel, de context en de procedure van het onderzoek. Daarnaast wordt elk van de respondenten van de vragenlijst geinformeerd over het doel, de context en procedure van het onderzoek dmv een begeleidende mail, en de introductie tekst van de vragenlijst.
De respondenten van de interviews worden naast de informatie die zij krijgen van de contactpersoon van de school, nader geinformeerd via de uitnodigende mail. Daarnaast ontvangen zij voorafgaand aan het interview mondelinge informatie van de onderzoeker van de Universiteit Twente over het doel, context en procedure van het interview. Ook ontvangen zij extra informatie over: de rechten van de geinterviewde mbt het eventueel terugtrekken van het interview, de anonieme verwerking, en moeten zij toestemming geven voor audio opnames.

17c. Welke informatie ontvangen proefpersonen (en/of ouders/verzorgers) vooraf over het doel en de inhoud van het onderzoek?
Vragenlijst:
In het verleden (specifiek jaartal) is de datateam methode gestart op uw school binnen het zogeheten datateam. Deze vragenlijst bevat vragen over de duurzaamheid hiervan: welke aspecten ziet u nog steeds terug in uw organisatie en wat is de stand van zaken mbt het huidige datagebruik. Ook worden er vragen gesteld over de mogelijke beinvloedende factoren op deze duurzaamheid. Om dit te onderzoeken worden er vragenlijsten afgenomen op alle 35 scholen die hebben deelgenomen aan de datateam methode. Daarbij bevragen we niet alleen de datateamleden, maar ook de collega's, teamleiders, schoolleiders en het bestuur, om de duurzaamheid op alle lagen van de organisatie in kaart te brengen. Daarnaast gaan we nog enkele verdiepende interviews houden bij een aantal scholen. Deze vragenlijst duurt maximaal 20 minuten. Alle gegevens worden anoniem verwerkt. We vragen naar uw school, emailadres en achtergrondinformatie om gegevens te kunnen koppelen en interpreteren.
Interviews:
In het verleden is de datateam methode gestart op uw school binnen het datateam. Deze vragenlijst bevat vragen over de duurzaamheid hiervan: welke aspecten ziet u nog steeds terug in uw organisatie en wat is de stand van zaken mbt het huidige datagebruik. Ook worden er vragen gesteld over de mogelijke beinvloedende factoren op deze duurzaamheid. Om dit te onderzoeken zijn er vragenlijsten afgenomen op alle 35 scholen die hebben deelgenomen aan de datateam methode. Daarbij bevragen we niet alleen de datateamleden, maar ook de

collega's, teamleiders, schoolleiders en het bestuur, om de duurzaamheid op alle lagen van de organisatie in kaart te brengen. Om de processen nader te onderzoeken, worden er verdiepende interviews gehouden. Dit interview duurt max 45 minuten. Het gaat hier niet om een beoordeling van de datateam methode, of uw organisatie. Gegevens worden anoniem verwerkt. We zorgen ervoor dat individuele resultaten niet herleid kunnen worden.

18. Informed Consent

18a. Verlenen proefpersonen (en in geval van niet-wilsbekwame proefpersonen: de voogd of ouders/verzorgers) vooraf schriftelijk toestemming voor het onderzoek door middel van een 'Informed Consent' formulier met daarin informatie over doel, aard en duur, risico's en bezwaren?

Het gebruik van een Informed Consent formulier heeft sterk de voorkeur! Een standaard Informed Consent formulier is te vinden op de website van de Commissie Ethiek.

Ja

19. Volledige voorlichting achteraf

19. Op welke manier vindt de debriefing plaats? Kunnen proefpersonen (en/of hun ouders/verzorgers) bijvoorbeeld naderhand nog in contact treden met de onderzoeker over het onderzoek?

Indien Ja: op welke wijze?
Indien Nee: waarom niet?

Dit is een praktijkgericht onderzoek. Onderzoeksresultaten worden teruggekoppeld aan de contactpersonen van elke school. Daarnaast is er nauwe samenwerking met Stichting Carmel College in dit onderzoek. Binnen deze stichting hebben 27 van de in totaal 44 datateams gedraaid. Via het coordinatieteam onderwijs en onderzoek, worden de resultaten binnen de stichting verspreid, onder alle lagen van de organisatie. Verder ontvangen alle respondenten contactinformatie van de onderzoekers, mochten er achteraf nog vragen of opmerkingen zijn. Ook kunnen zij achteraf besluiten hun deelname terug te trekken uit het onderzoek, wat ze dan kunnen aangeven bij de onderzoeker. Via de contactpersoon van de school, kan er ook contact worden gelegd met de onderzoekers van de UT. De resultaten worden echter niet op individueel of schoolniveau gerapporteerd.

20. Afhankelijkheid proefpersonen

20a. Beschrijf de relatie tussen de hoofdonderzoeker/onderzoekers enerzijds en de proefpersonen anderzijds.

De promovendus in dit project is zelf teamleider op een school. De andere onderzoeker is post doc onderzoeker bij ELAN. De postdoc onderzoeker zal de interviews afnemen bij de school van de promovendus, om onafhankelijk onderzoek te waarborgen. De rest zal verdeeld worden.

20b. Zijn de proefpersonen, buiten de context van het onderzoek, in een afhankelijke of ondergeschikte positie t.o.v. de onderzoeker?

Nee

20c. Toelichting

Indien Ja: op welke wijze?

–

21. Duidelijkheid t.a.v. terugtrekken

21a. Wordt proefpersonen duidelijk gemaakt dat zij zich te allen tijde zonder verklaring/rechtvaardiging kunnen terugtrekken?

Ja

22. Beloning proefpersonen

LET OP: Alleen voor onderzoek waarbij alleen proefpersoon credits worden gegeven, kan gebruik gemaakt worden maken van het SONA systeem.

22. Welke beloning(en) kunnen proefpersonen ontvangen voor hun deelname aan het onderzoek.

Geen

23. Opslag en verwerking gegevens

23a. Worden gegevens van het onderzoek vertrouwelijk behandeld en anoniem opgeslagen en verwerkt?

Ja

24. Inzage gegevens

24a. Hebben proefpersonen achteraf inzage in hun eigen gegevens?

Ja

Opmerkingen

Uw reactie

-

Vragen/opmerkingen van onderzoeker, begeleidend docent en commissie

2017-03-23 16:40:10 - Prenger, H.C. :

-

2017-03-23 16:12:50 - Poortman, C.L. :

Omdat ik begeleider ben mag ik niet definitief oordelen. Mijn betrokkenheid bij voorstel aangeven bij uitvoerders. Let ook nog op het volgende:
11b hoezo niet 50-50
11c niet ism maar begeleid door
14b de resultaten worden anoniem verwerkt en het gaat niet om een beoordeling
17c afgebroken. Mag ook de strekking/.samenvatting zijn
19: de resultaten worden echter niet op individueel of schoolniveau gerapporteerd.

Appendix F. Information letter Interview and Study

Informatiebrief interviews ronde 1 en 2

Enschede, ……..-……..-……..

Beste lezer,

Met deze brief willen we u informeren over het interview waarvoor u zich hebt aangemeld. Het interview vindt plaats op …….-…...- 2017, in ruimte [……] van [……..]. Met ons onderzoek richten we ons op de duurzaamheid van datagebruik op scholen waar gewerkt is met de Datateam methode. In dit interview stellen we vragen over factoren die mogelijk van invloed zijn op de duurzaamheid van datagebruik.

Deelname aan het interview duurt maximaal 45 minuten (achtereenvolgend). Het interview zal bestaan uit een introductie over het doel van het onderzoek. Vervolgens wordt gesproken over duurzaamheid van datagebruik en de factoren die daarvan op invloed zijn. Het is niet nodig om iets voor te bereiden.

Het gehele gesprek tijdens de bijeenkomst wordt opgenomen om de betrouwbaarheid van de analyse te ondersteunen. Ten allen tijde mag u besluiten om tijdens de bijeenkomst te stoppen zonder dat dit consequenties heeft, waarbij ook geen reden aangegeven hoeft te worden. U kan ook na afloop van het onderzoek, tot 24 uur daarna, alsnog besluiten dat uw inbreng niet verder mee wordt genomen in het onderzoek. Andere relevante aspecten zijn dat met uw gegevens op een vertrouwelijke wijze wordt omgegaan, en dat anonimiteit van uw gegevens is gewaarborgd en dat deze nooit aan derden zonder uw toestemming zullen worden verstrekt.

Alvast bedankt voor uw deelname.

Met hartelijke groet,

Dr. Rilana Prenger
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Appendix G. Informed consent form

Informed consent deelnemer

'Ik verklaar hierbij op voor mij duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek, zoals uiteengezet in de informatiebrief. Daarnaast verklaar ik dat ik mijn gegevens naar waarheid heb ingevuld.

Mijn vragen zijn naar tevredenheid beantwoord. Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud daarbij het recht deze instemming weer in te trekken zonder dat ik daarvoor een reden hoef op te geven en besef dat ik op elk moment mag stoppen met mijn deelname. Indien mijn onderzoeksresultaten gebruikt zullen worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, zal dit volledig geanonimiseerd gebeuren. Mijn persoonsgegevens zullen niet door derden worden ingezien zonder mijn uitdrukkelijke toestemming. Als ik nog verdere informatie over het onderzoek zou willen krijgen, nu of in de toekomst, kan ik me wenden tot onderzoeker Rilana Prenger.

Voor eventuele klachten over dit onderzoek kunt u zich wenden tot de secretaris van de Commissie Ethiek van de faculteit Gedragswetenschappen van de Universiteit Twente, mevr. J. Rademaker (telefoon: 053-4894591; e-mail:j.rademaker@utwente.nl, Postbus 217, 7500 AE Enschede). Aldus in tweevoud getekend:

……	……
Naam deelnemer interview	*Handtekening*

'Ik heb toelichting verstrekt op het onderzoek. Ik verklaar mij bereid nog opkomende vragen over het onderzoek naar vermogen te beantwoorden.'

……	……
Naam onderzoeker	*Handtekening*

Informed consent onderzoeker

'Ik verklaar hierbij op voor mij duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek, zoals uiteengezet in de informatiebrief. Daarnaast verklaar ik dat ik mijn gegevens naar waarheid heb ingevuld.

Mijn vragen zijn naar tevredenheid beantwoord. Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud daarbij het recht deze instemming weer in te trekken zonder dat ik daarvoor een reden hoef op te geven en besef dat ik op elk moment mag stoppen met mijn deelname. Indien mijn onderzoeksresultaten gebruikt zullen worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, zal dit volledig geanonimiseerd gebeuren. Mijn persoonsgegevens zullen niet door derden worden ingezien zonder mijn uitdrukkelijke toestemming. Als ik nog verdere informatie over het onderzoek zou willen krijgen, nu of in de toekomst, kan ik me wenden tot onderzoeker Rilana Prenger.

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……	……
Naam deelnemer interview	*Handtekening*

'Ik heb toelichting verstrekt op het onderzoek. Ik verklaar mij bereid nog opkomende vragen over het onderzoek naar vermogen te beantwoorden.'

……	……
Naam onderzoeker	*Handtekening*

Appendix H. form respondents information.

Deelnemergegevens

Naam:		
Leeftijd:		Man/Vrouw*
Aantal jaar werkzaam in het onderwijs:		
Waarvan op de huidige school:		
Klas(sen):		

* doorhalen wat niet van toepassing is

Ik ontvang graag bij het afronden van het interview een uitwerking op dit e-mail adres:

_____

Appendix I. Coding scheme

Codeerschema interviews

Construct en definitie	Indicatoren	Code	Voorbeeld transcriptie
A. Sustainability *Duurzaamheid wordt bereikt wanneer de interventie zichtbaar is in ostensieve en performatieve routines, die zich hebben aangepast aan de behoeften van de school, terwijl er een voortdurend streven is naar vooruitgang.*	A.1. Organisatie heeft routines rondom gebruik van data. Ostensief: vastlegging van routines bijvoorbeeld in beleidsplannen, subjectieve opvatting personen, visie. Performatief: uitvoering/dagelijkse praktijk van de routines, door specifieke personen, weerspiegeling kennis, ervaring en reflectie.	A.1.1. ostensief	- 'Gebruik van data staat beschreven in teamplannen.' - 'Verbetering van het onderwijs doormiddel van data gebruik wordt benoemd in de schoolgids.' - 'Ons schoolbestuur heeft als visie data te gebruiken voor onderwijsverbetering.' -'Nee, volgens mij komt datagebruik niet terug in de teamplannen o.i.d.'
		A.1.2. performatief	- 'Ik gebruik data dagelijks voor het inrichten van mijn onderwijs.' - 'Datagebruik is een terugkerend onderwerp van onze teambesprekingen.' - 'Data gebruik ik nauwelijks in de praktijk'
	A.2. Data gebruik is aangepast aan de behoeften van de school	A.2.1. Behoeften school	- 'We hebben datagebruik aangepast aan ons onderwijs.' - 'Datagebruik is nog onderdeel van ons onderwijs op een manier die past bij ons team en onderwijs.'
	A.3. Er is een voortdurend streven naar vooruitgang	A.3.1 verbetering onderwijs	- 'We bieden waar mogelijk onderwijs op maat op basis van de analyse van toets gegevens van leerlingen.' - 'We streven ernaar om onze leerlingen het beste onderwijs aan te bieden.'
		A.3.2. verbetering data gebruik	- 'Steeds meer collega's zien het nut in van data en maken er gebruik van voor hun onderwijs.' - 'Datagebruik is een speerpunt van ons onderwijs waar we ons personeel in onderwijzen en faciliteren.'

			- 'Wij zijn niet meer bezig met het gebruik van data en het verbeteren hiervan.'

Construct en definitie	Indicatoren	Code	Voorbeeld transcriptie
Knowledge Sharing *Het proces van het delen van kennis en vaardigheden binnen het datateam, in de termen wederkerigheid en centralisatie, met het doel de capaciteit voor datagebruik te vergroten binnen het datateam.*	C.1. Er is sprake van een gelijkwaardige relatie tussen collega's in termen van betrokkenheid, verantwoordelijkheid en inzet.	C.1.1. Wederkerigheid	- 'Mijn collega's zijn bereid net zo veel werk te verzetten als ik doe.' - 'Mijn collega's tonen net zoveel betrokkenheid bij datagebruik en het proces als ik doe.'
	C.2. Er is sprake van een gelijke verdeling van kennis en vaardigheden binnen het team.	C.2.1. Centralisatie	- 'Collega x verwerkt alle verzamelde data, ik vervul een andere taak binnen de datateam methode.' - 'De datateam leden zijn allen in staat de acht stappen van de datateam methode succesvol te doorlopen.' - 'Als collega x vertrekt, dan vertrekt specifieke kennis omtrent datagebruik ook.'
	C.3. Kennisdeling (**Binnen het datateam)**	C.3.1. Kennisdeling gebruik van data	- 'We delen onze ervaringen met het proces van de datateam methode met de datateam leden.' - 'Als een datateamlid vragen heeft over de stappen van de datateam methode helpen wij hierbij.'
		C.3.2. Kennisdeling educatieve probleem	- 'Bevindingen over het educatieve probleem en de corresponderende maatregelen worden gedeeld binnen het datateam.' - 'Binnen het datateam wordt er discussie gevoerd over *het educatieve probleem*.'

Construct en definitie	Indicatoren	Code	Voorbeeld transcriptie
Knowledge Brokerage	D.1. Buitenwaartse bemiddeling 'vertegenwoordiger'	D.1.1. Buitenwaartse	- 'Een lid van het datateam vertelt regelmatig aan het betrokken

Het proces en de activiteiten van sleutelfiguren binnen het datateam die praktijk en theorie verbinden in de termen buitenwaartse, binnenwaartse en voorwaartse bemiddeling, met als doel de capaciteit voor datagebruik te vergroten binnen de school.	Overdracht van kennis over proces datateam methode of het educatieve probleem van een datateamlid via de 'vertegenwoordiger' naar een collega.	bemiddeling proces datateam methode	team waar in het proces van de datateam methode ze zijn.' 'Het datateam heeft het proces van de datateam methode gedeeld met de collega's tijdens een studiedag.'
		D.1.2. Buitenwaartse bemiddeling educatief probleem	- 'Een vertegenwoordiger van het datateam heeft bevindingen van het datateam gedeeld met de betrokken collega's.'
	D.2. Binnenwaartse bemiddeling 'poortwachter' Overdracht van kennis over proces datateam methode of het educatieve probleem van een collega via de 'poortwachter' naar een datateamlid	D.2.1. Binnenwaartse bemiddeling proces datateam methode	- 'Wij (collega's) hebben datateamleden benaderd met vragen/opmerkingen/toelichting over het proces of de maatregelen behorend bij *het educatieve probleem*.' - 'Wij (datateam leden) zijn door collega's benaderd met vragen/opmerkingen over het proces en hebben dit bespreekbaar gemaakt in het datateam.'
		D.2.2. Binnenwaartse bemiddeling educatief probleem	- 'Collega's hebben datateamleden benaderd met vragen of opmerkingen over de te treffen maatregelen, die vervolgens behandeld zijn door het datateam.' - 'Wij (datateam leden) zijn door collega's benaderd met vragen/opmerkingen over het educatief probleem en hebben dit bespreekbaar gemaakt in het datateam.'
	D.3. Voorwaartse bemiddeling 'consultant' Overdracht van kennis over proces datateam methode of het educatieve probleem van een collega via de 'consultant' naar een collega.	D.3.1 Voorwaartse bemiddeling proces datateam methode	- 'Een collega heeft een lid van het datateam benaderd met vragen over het proces van de datateam methode, wij hebben dit in een volgende teamvergadering gedeeld met het betrokken team.'

		D.3.2. Voorwaartse bemiddeling proces educatief probleem	- ‘Bevindingen van een collega over zijn of haar klas zijn voorgelegd aan het datateam, vervolgens zijn deze bevindingen gedeeld met de rest van de collega’s.’ - ‘Een datateam lid heeft weleens gefungeerd als brug/consultant tussen collega’s die met een gelijksoortig probleem kampen.