



The quest for sustained data use: Developing organizational routines



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H I G H L I G H T S

- Schools' organizational routines for data use were scarce and developed little over time.
- Especially the ostensive aspect (e.g., policy and vision for data use) was underdeveloped.
- Interventions for data use should target the development of organizational routines.

A R T I C L E I N F O

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The data team intervention was designed to support schools' data use. The sustainability of schools' data use was investigated by studying the schools' development of the ostensive and performative aspects of organizational routines for: engaging in the data team intervention, acting upon their data team's improvement plan, and using data for school development and instruction. Six Dutch secondary schools participated in this longitudinal mixed-methods study. Data were collected through questionnaires, policy documents, and interviews. Results indicated that schools struggled to develop organizational routines for data use, especially the ostensive aspects. This illuminated the process by which schools did not sustain their use of data. The findings showed that interventions for data use should more clearly target the development of organizational routines.

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1. Introduction

Data-based decision making in education has been emphasized globally in recent years (Datnow & Hubbard, 2015; Datnow, Park, & Kennedy-Lewis, 2013). Data-based decision making, or data use for short, is important because decisions informed by data are more likely to be effective than decisions based on intuition and experience (Schildkamp & Poortman, 2015; Schildkamp, Poortman, & Handelzalts, 2015). Data can support teachers' processes of reflection and provide insight into their strengths and weaknesses. As a result, teachers may change their behavior, such as by trying out different instructional strategies, which can improve their own performance (Schildkamp & Kuiper, 2010). Overall, the use of data can improve the quality of the education provided by individual teachers, schools, or districts, which can lead to improved student achievement (Campbell & Fullan, 2006; Carlson, Borman, &

Robinson, 2011; Lai & Schildkamp, 2013; Van Geel, Keuning, Visscher, & Fox, 2016).

Even though data use is associated with various benefits, previous studies have shown that most teachers do not use data to its best effect or do not use data at all (e.g., Means, Chen, DeBarger, & Padilla, 2011; Oláh, Lawrence, & Riggan, 2010). To support schools in their use of data, several professional development programs have been developed that target (a combination of) student learning, teacher learning, and organizational change (e.g., Coburn & Turner, 2011; Ikemoto & Honig, 2010; Karr, Marsh, Ikemoto, Darilek, & Barney, 2006; Marsh, McCombs, & Martorell, 2009; Schildkamp et al., 2015).

One such professional development program is the data team intervention (Schildkamp et al., 2015). Teams that work according to this intervention consist of six to eight teachers and school leaders, who learn how to use data to analyze and address an educational problem in their school (e.g., high grade retention rates). Previous research has illustrated that working with this intervention increased data team members' knowledge and skills regarding data use (Ebbeler, Poortman, Schildkamp, & Pieters, 2016), and that working with this intervention can lead to increased student achievement (Poortman & Schildkamp, 2016).

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However, it is not yet known whether working with this intervention can result in lasting school-wide changes in policy, the organization of work, and work practices themselves (e.g., Coburn & Turner, 2011; Honig, 2008; Sherer & Spillane, 2011), an issue referred to as sustainability (Fullan, 2007). The extent to which data use is sustained can be studied through the development of schools' organizational routines. These routines are recurring actions that structure everyday practice in schools by supporting and focusing interactions among school staff (March & Simon, 1958; Nelson & Winter 1982). They include both the broader organizational system of the school and actual work practices (Sherer & Spillane, 2011).

Even though the development of organizational routines is key in understanding whether and how data use programs lead to sustainable changes in educational practice (Spillane, 2012), few studies have addressed the development of such routines (e.g., Coburn & Turner, 2011; Little, 2012; Spillane, 2012). Insights into schools' organizational routines is crucial for coming to a deeper understanding of the dynamic between an intervention, and the resulting on-the-ground responses and actions, such as how data are being used (Coburn & Turner, 2011; Marsh, 2012). Furthermore, these insights are critical for making an informed decision on whether a program is worth the investment of efforts and resources (Coburn & Turner, 2011). The present study aimed to investigate whether schools who implemented the data team intervention sustained their data use. Doing so involved studying how their organizational routines related to data use developed over time. This provides insight into the process through which schools did or did not sustain the use of data in their educational practice.

2. Theoretical framework

2.1. Teachers' professional development

The use of professional learning communities is seen as an important way to support teachers in rethinking their own practice and improving their teaching (Vescio, Ross, & Adams, 2008). Despite promising research results, professional development and school improvement do not automatically take place as a result of working in these communities. Previous research illustrated that the effects may be small and results are mixed (Chapman & Muijs, 2014; Lomos, Hofman, & Bosker, 2011). Therefore, one of the biggest challenges is to make sustainable school-wide changes in policy and practice (e.g., Harris & Jones, 2010; Van Veen et al., 2010).

To study this sustainability challenge, roughly two perspectives can be distinguished: the determinants and the dimensions of change (Crossan & Apaydin, 2010). The former refers to the way in which factors influence the implementation of change. Examples include the role of school climate, school leaders, teachers' beliefs, sensemaking, agency, and available time/money (Coburn & Talbert, 2006; Datnow, Park, & Wohlstetter, 2007; Desimone, 2002; Kurland, Peretz, & Hertz-Lazarowitz, 2010; Penuel, Fishman, Cheng, & Sabelli, 2011; Schildkamp & Kuiper, 2010; Visscher, 2002). The latter, the dimensions of change, refers to the process (the 'how') of change and the outcome of the change (the 'what') (Crossan & Apaydin, 2010). The process view is especially underdeveloped in the literature (Crossan & Apaydin, 2010). As this is a crucial aspect of understanding how change develops in schools, the present study used a process view. The development of schools' organizational routines was studied to determine whether sustainable changes were made while some teachers worked in professional learning communities (data teams).

2.2. Organizational routines

Much of the work in schools takes place in and through organizational routines (Nelson & Winter 1982). An organizational routine can be defined as 'a repetitive, recognizable pattern of interdependent actions, involving multiple actors' (Feldman & Pentland, 2003, pp. 96). An example of this would be a group of mathematics teachers who determine at the end of each year how their students have performed and use this information to determine how the coherence in the curriculum can be improved.

There are several reasons why the data team intervention, and other professional development programs for that matter, can alter the organizational routines around data use in a school (Coburn & Turner, 2011). First, an intervention can bring educators together in new and different combinations, which can influence the dynamics through which they both interpret the data and design corresponding actions for improvement (Coburn & Russell, 2008). For example, Marsh, Bertrand, and Huguet (2015) found that teachers' participation in data use professional learning communities played an important role in teachers' responses to data, and, subsequently, that they used those data to alter their instructional delivery. Second, an intervention can shape individual and collective beliefs; for example, ample time can be provided to openly discuss student achievement and reexamine requirements (McDougall, Saunders, & Goldenberg, 2007). Third, it can shape what educators notice and attend to by focusing their attention on certain data and not others (e.g., Ikemoto & Honig, 2010; Sherer & Spillane, 2011). Finally, those engaging in the intervention can broker their (newly gained) knowledge about data use and the corresponding actions for improvement to their colleagues (Hubers et al., 2017). This can facilitate the school staff's participation in discussions on school-wide issues and increase communication about data use and the issues those data indicate to be important (Huffman & Kalnin, 2003; Lachat & Smith, 2005).

Organizational routines illuminate the extent to which data are used because they focus our attention on the interactions among school staff (Spillane, 2012). In these interactions, teachers and school leaders negotiate what data are worth noticing and what these data mean for current practice at the school and classroom levels. This clarifies the extent to which data use is valued. Moreover, organizational routines remove the focus from unique occurrences and direct the focus to standard ways of doing things at the school. This provides insight into how data are currently used in practice and how efforts to increase data use might turn out over time. Finally, studying organizational routines results in a more nuanced image of how practices change or persist over time. No one decision, formal structure or person is responsible for this; they all mutually influence each other (Spillane, 2012). This mutual influence comes across in the two aspects of which an organizational routine consists: the ostensive aspect and the performative aspect (Feldman & Pentland, 2003).

2.3. The ostensive aspect

The ostensive aspect of an organizational routine is the schematic, abstract idea of the routine (Feldman & Pentland, 2003), relying on standard operating procedures and taken-for-granted norms. According to Feldman and Pentland, it also includes one's subjective understanding of the routine. These routines never include specific performances, because it is impossible to specify a routine in the amount of detail required to actually carry it out (Blau, 1955; Feldman & Pentland, 2003). An example of the ostensive aspect would be the school principal's vision for working with the data team intervention, as written in the school's policy document. Studying ostensive aspects of organizational routines

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