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## **Evidence-based actions within the multilevel system of schools – Requirements, processes, and effects (EviS)**

Special Issue Editorial

### **Abstract**

*In recent years, research on school improvement in Germany has provided a scientific basis for assessing school and classroom practices and gaining perspectives for improvement. New evaluation instruments have been developed and implemented for output-oriented and evidence-based school governance. The concept of evidence-based governance marks a paradigm shift in the school system in Germany, as actors at the school level are starting to use empirical evidence from evaluations as a basis for professional decisions and actions. However, the present state of research shows that teachers and principals use evidence to a limited extent in everyday practice and in school and classroom improvement processes. The interdisciplinary research project Evidence-based actions within the multilevel system of schools (EviS) investigated requirements, processes, and effects of evidence-based school and classroom improvement in Germany.*

### **Keywords**

*Evidence-based action; Data-based school improvement; New governance model; Data use; EviS*

## **Evidenzbasiertes Handeln im schulischen Mehrebenensystem – Bedingungen, Prozesse und Wirkungen (EviS)**

Special Issue Editorial

### **Zusammenfassung**

*Zur Qualitätsentwicklung im deutschen Schulsystem wurden in den letzten Jahren verstärkt wissenschaftliche Grundlagen für eine verlässliche Bestandsaufnahme*

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*und Entwicklung von schulischen und unterrichtlichen Praktiken geschaffen sowie neue Instrumente zu einer outputorientierten und evidenzbasierten Steuerung implementiert. Das Konzept der evidenzbasierten Steuerung stellt im deutschen Bildungssystem eine umfassende Innovation dar, die den schulischen Akteuren mittels verschiedener Evaluationsinstrumente Steuerungswissen als Handlungsgrundlage zur Verfügung stellt. Der aktuelle Forschungsstand zeigt jedoch, dass das professionelle Handeln schulischer Akteure nur bedingt auf Grundlage von Evidenzen basiert bzw. unterrichtliche und schulische Entwicklungsprozesse wenig evidenzbasiert erfolgen. Im Rahmen des interdisziplinären Forschungsverbunds Evidenzbasiertes Handeln im schulischen Mehrebenensystem (EviS) werden die Bedingungen, Prozesse und Wirkungen einer evidenzbasierten Schulentwicklung untersucht.*

### **Schlagworte**

*Evidenzbasierung; Datengestützte Schulentwicklung; Neues Steuerungsmodell; Datennutzung; EviS*

## **1. Evidence-based school improvement – The German research project EviS**

In recent years, the school system in Germany has been adapted to correspond with the new governance model, a new approach to public management (e.g., Thiel, Cortina, & Pant, 2014). The new governance model has brought about a paradigm shift in education, encouraging the use of empirical evidence and data, for example from evaluations, in educational policy making and school improvement efforts (e.g., Altrichter, 2010). A central goal is to provide educational policy makers and actors at the school level with valid insights from evaluations, such as performance tests or school inspections, as a basis for school and classroom improvement. To this end, great attention recently has been given to the development and implementation of elaborate evaluation and governance instruments. Since the introduction of the new governance model in the school sector, changes have included not only increased focus on evidence and output, but also more organizational self-governance and greater school autonomy. Teachers and principals are considered central actors in evidence-based school and classroom improvement efforts (e.g., Schrader & Helmke, 2004; Gruber & Leutner, 2003). Hence, a key condition for the success of evidence-based governance and school improvement is the ability and willingness of actors at the school level to adopt new governance instruments and to use the generated data effectively in school and classroom practice (e.g., Imants, Slegers, & Witziers, 2001).

The concept of evidence-based action has become established in various fields such as medicine (e.g., Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996) and management (e.g., Pfeffer & Sutton, 2006). Accordingly, professional actions and

decisions and processes within an organization “should be based on the latest and best knowledge of what actually works” (Pfeffer & Sutton, 2006, p. 2). Evidence-based action in education also is referred to as data-based practice and data use in schools.<sup>1</sup> Major challenges arise when putting available evidence into individual and organizational practice, which is not systematically organized in the school sector in Germany (e.g., Fleischmann, 2009). The considerable gap between research and practice (Latham, 2007) underlines the difficulty of professional evidence-based action and the need to present scientific findings in a way that accommodates the context of individual schools and actors at the schools (Davies, 1999).

Most studies in Germany and internationally have focused on the effects of single evaluation-based instruments and processes on school and classroom practices only.<sup>2</sup> In German- and English-language studies of the use of evaluation findings principals and teachers have been found to use available evidence only to a limited extent in their everyday work and in classroom and school improvement processes. More detailed research is needed on the factors that influence individual and collective evidence-based action in schools. Further, the most effective ways to present the evidence so as to encourage practical use of it in schools must be identified.

The goal of the interdisciplinary collaborative research project *Evidence-based actions within the multilevel system of schools* (EviS)<sup>3</sup> was to address these issues by providing empirically sound insights into requirements, processes, and effects of evidence-based school governance in Germany. The main aims of the EviS project (2010–2016) were to describe and operationalize evidence-based action in schools and identify individual requirements and organizational factors or constellations of factors that support or inhibit evidence-based action in schools.

In the EviS project, evidence-based action was conceptualized as teachers’ and principals’ professional decisions and actions based on their knowledge from evaluations. Evaluation-based knowledge comprised knowledge from external sources, for example, school inspections or large-scale assessments, and knowledge from internal sources, for example, internal evaluations of the school. Alternatively, professional action not based on evidence from evaluations was considered to be based

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1 In this special issue these terms are considered synonyms, given that quantitative evaluation data are one of the key types of empirical evidence used for classroom and school improvement.

2 For more information on the effects of external evaluations, such as school inspections, see, e.g., Böttcher and Kotthoff (2007), Wurster and Gärtner (2013), Dederich (2012), Altrichter, McNamara, and O’Hara (2013); on state surveys of student learning, see, e.g., Maier (2009), Schrader and Helmke (2004); Groß Ophof, Koch, Hosenfeld, and Helmke (2006); on standardized final examinations, see, e.g., Kühn (2010), Klein (2013), and Maag Merki (2010).

3 The EviS project was funded by the German Federal Ministry of Education and Research under grant number 01JG1010. The first funding phase, EviS I, ran from September 2010 to August 2013; the second funding phase, EviS II, from September 2013 to August 2016. The collaborative EviS project was carried out by an interdisciplinary team of researchers from the areas of pedagogy, educational sciences, vocational and business education, psychology, sociology, and evaluation research. For more information, see <http://www.blogs.uni-mainz.de/fb03-wipaed-epis/>.

on substitutes for evidence such as personal, everyday experiences (see Dormann et al., 2016).

The EviS project comprised one main study and two additional in-depth studies and combined qualitative and quantitative approaches. In the main study, a standardized questionnaire on the reception and use of evidence was completed by teachers ( $N = 2,640$ ) and principals ( $N = 297$ ) at all types of schools ( $N = 153$ ) in the German federal state of Rhineland-Palatinate. A multilevel analysis of the data was conducted to determine the extent to which the teachers' and principals' actions were evidence-based, to identify the personal and institutional influences of the teachers' and principals' evidence-based actions, and to predict potential differences among individuals and organizations in their use of empirical evidence from evaluations in their practice.

In this main study, evidence-based action was examined at three levels: (a) school, (b) principal, and (c) teacher. At the school level (a), framework requirements such as organizational climate and organizational culture and their relationship to evidence-based action were analyzed. For this purpose, organizational attributes and aggregated attributes from the level of individual teachers were examined. Principals (b) were modeled at a separate level because they had a special influence on and partly represented the organizational level. Depending on the research question, principals could be attributed to the individual level or the school level. At the individual teacher level (c), the requirements and processes of reception, transfer, and use of evidence from school evaluations and large-scale learning assessments were examined.

In the first additional in-depth study, the development of teachers' evidence-based actions during pre-service teacher training was examined. In a longitudinal study, a survey was conducted with students of educational sciences and business education ( $N = 1,272$ ) and teacher trainees for vocational and secondary schools ( $N = 328$ ). The participants were surveyed on their evidence-based actions during professional training and their development of cognitive, motivational, and self-regulatory dispositions, for example, their attitudes towards and knowledge about the professional use of evaluation-based data. By the second measuring date, most participants had advanced to the next phase of professional training, that is, they had entered either the practical training phase or the teaching profession.

In the second additional in-depth study, case studies were conducted of selected schools that had shown a particularly high or low level of evidence-based action in the main study. From a theoretical sampling, four secondary schools and three vocational schools were selected. Standardized interviews were conducted to gather information on school networks and individual teachers' social networks. The data of 925 teachers comprising their 4,025 network partners were analyzed with regard to the teachers' use of evidence gained from different sources in their practice and to how social structures within their schools influenced those actions.

## 2. Overview of the articles in the Special Issue

In this special issue, we present key results from the interdisciplinary collaborative research project EviS.

*Dormann et al.* (2016) explore evidence-based school practice and their three-factor structure, comprising external evidence orientation, internal evidence orientation, and evidence substitute orientation.<sup>4</sup> In this article, they investigate empirically whether evidence-based school practice can be assessed reliably and validly based on teachers' and principals' perceptions. In line with van Ackeren et al. (2013), evidence-based school practice is characterized as being a combination of substantial orientation towards the use of evidence and marginal orientation towards the use of substitutes for evidence. Analyzing data from the EviS project, they confirm the three-factorial structure of evidence-based school practice assessed through teachers' perceptions. They found teachers' perceptions of their principal's orientation towards evidence and substitutes for evidence were influenced by previous use of evidence from evaluation measures, such as school assessments, in the same school. Overall, schools in which actions were evidence-based, that is, those scoring high on external evidence orientation and internal evidence orientation and low on evidence substitute orientation, formed the largest group in the sample. Dormann et al. close by highlighting the great potential of orientation towards evidence as a successful strategy for improving school practice.

*Demski, van Ackeren, and Clausen* (2016) analyze the relationship between school culture and evidence-based practice. To assess school culture empirically they used the six dimensions of the *Organizational Culture Assessment Instrument* (OCAI) and adapted them to the school context. Research findings have indicated that school climate and school culture influence the use of evidence-based information (Saunders & Rudd, 1999). The central question in this article is which types of school cultures support or inhibit evidence-based action. To this end, the authors draw on established types of school culture from the Competing Value Model (Quinn & Rohrbaugh, 1983). In the EviS project, instruments of new governance such as school inspections, print media, and school-specific information related to internal processes were considered as sources forming a basis for evidence-based action: Across all schools, the three highest-ranked sources of evidence were (a) process-oriented assessment, including student feedback, (b) cooperative lesson planning, and (c) professional journals in their teaching subjects. The authors attribute this to the fact that these sources of evidence are better targeted to the individual school context (Demski, Rosenbusch, van Ackeren, Clausen, & Schmidt, 2012). By comparison, instruments of new governance were hardly being used.

4 External evidence orientation refers to research results and scientists' expertise. Internal evidence orientation refers to employees' and managers' expertise and local context. Evidence substitute orientation refers to substitute knowledge derived directly from school and classroom practice, like teachers' experience. The same three-factor structure was identified by Stumm, Mohr, and Dormann (2010) for employees in public administrations. Dormann et al. adapted their scales on evidence-based management to the school context.

*Zlatkin-Troitschanskaia, Förster, Preuße, and Mater (2016)* focus on the relationship between teachers' evidence-based actions and communication, cooperation, and participation structures at schools, particularly those changing under the new governance model. In their study they analyze how teachers' orientation towards empirical data from internal sources and external sources, which is considered an indicator of teachers' evidence-based actions, is related to school structures such as communication and information retrieval, internal and external cooperation, and participation. Teachers tend to use the sources of evidence from their own school rather than from external sources. Using multilevel structural equation modeling, the authors show that communication and information retrieval, internal and external cooperation, and participation structures explained up to 55 % of the variance in teachers' internal evidence orientation.

*Stump, Zlatkin-Troitschanskaia, and Mater (2016)* examine the effects of transformational leadership on evidence-based action. They differentiate their analysis according to various groups of actors at the school level and types of schools. They identify three dimensions of transformational leadership as a leadership style: (a) setting directions, (b) developing people, and (c) redesigning the organization. They assess transformational leadership using the corresponding scale developed by Rafferty and Griffin (2004). The results of the structural equation modeling indicated that transformational leadership had a highly positive effect on the various kinds of teachers' use of data. Furthermore, in their analyses they found no major differences in use of data between teachers and school principals. However, they found differences in use of data between types of schools, particularly between secondary schools and vocational schools. By comparison, transformational leadership at vocational schools led to slightly more use of external data and considerably less use of substitutes for data.

*Laier, Demski, van Ackeren, Clausen, and Preisendörfer (2016)* analyze the relationship between teachers' social networks and their use of evidence-based information in schools. To this end, they describe school action in terms of personal network attributes. These were expressed by the number of communication partners each teacher had. These communication exchanges were classified as social and work relationships. Using regression analyses, the authors examined the influence of communication exchanges on the use of different sources of information. In summary, the number of teachers' communication partners correlated positively with the number of sources of evidence they used. However, teachers' use of different sources of information stemmed mostly from the sources that had a specific connection to teaching. These included in particular professional journals in their teaching subjects, which were closely related to the teachers' own lessons. In contrast, the limited use of instruments of the new governance model indicated that even experienced teachers had difficulty interpreting evidence from these instruments and drawing conclusions for their professional actions.

### 3. Research perspectives

In line with other national and international studies, the findings from EviS for Germany indicate that teachers and principals use evaluation-based governance instruments to a limited extent in everyday professional practice. School and classroom improvement often is not based on evidence from evaluations. The EviS project has provided an insight into evaluation-based governance and has highlighted effective strategies of knowledge transfer from research to schools in order to promote the use of evidence in school and classroom practice. For instance, one of the major reasons identified in the study as to why evaluation findings do not transfer well into practice is that feedback from external evaluations does not sufficiently match teachers' specific situation at their schools.

The studies in this special issue identify various influence factors on evidence-based action in schools. Further research is necessary to determine the extent to which these predictors directly affect measured evidence-based practice in schools. The self-reports used in the project were deemed relevant indicators of existing structures. Nonetheless, the focus of future research should be constructing objective measurement instruments.

The results presented in this special issue underline how the professional use of evidence can be influenced by various factors at different levels of the school system. Major influences on evidence-based practice included the school principals' actions, collective communication processes, and the individual professional competence of actors at the school level. Therefore, these three influence factors should be analyzed in greater detail in future research. The in-depth interdisciplinary analyses presented here have contributed to a better understanding of ways to promote evidence-based school and classroom practice.

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