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International perspectives on understanding and improving teachers' data-based instruction and decision making: introduction to the special series

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International Perspectives on Understanding and Improving Teachers' Data-Based Instruction and Decision Making: Introduction to the Special Series

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Abstract

This article serves as an introduction to the special series, *Data-Based Instruction and Decision-Making: An International Perspective*. In this series, we bring together international researchers from both special and general education to address teachers' use (or non-use) of data for instructional decision making. Via this special series, we aim to increase understanding of the challenges involved in teachers' data-based instructional decision making for students with or at-risk for learning disabilities, and to further the development of approaches for improving teachers' ability to plan, adjust, and adapt instruction in response to data.

Keywords

CBM, teacher education/preparation, learning disability

The idea for this special series of *Journal of Learning Disabilities* (JLD) emerged at a scientific meeting held in the Netherlands in June of 2018, titled, *Data-Based Decision-Making in Education: The Data Are There . . . Why Aren't They Used?* The meeting was supported by Leiden University's Lorentz Center, which has as its goal to bring together international scientists to address topics from diverse perspectives. Attending the Lorentz Center meeting were special- and general-education researchers from the United States, Germany, The Netherlands, Switzerland, and Poland, all of whom were working on research related to the use (or non-use) of educational data for decision making. As an outcome of the Lorentz meeting, new scientific collaborations and partnerships were forged, leading to joint projects and publications—including this special series of JLD focused on teachers' *data-based instruction* (DBI).

DBI

DBI, also referred to as *data-based decision making* (DBDM), is an approach in which teachers collect and use data to evaluate the effects of instruction on the academic progress of students with or at-risk for learning disabilities (LD; National Center on Intensive Intervention, 2013). The use of data for decision making has long been a cornerstone of special educational programming in the United States. For example, the 1975 Education for All Handicapped

Children Act (EAHCA or PL 94-142) required that individualized educational programs include evaluation procedures and criteria to determine whether students' instructional objectives had been met. More recently, the 2017 *Endrew F. v. Douglas County School District* Supreme Court ruling emphasized the importance of using progress data to judge the appropriateness of educational programs for individuals with disabilities (Sayeski et al., 2019; Yell & Bateman, 2019). However, data use for educational decision making is not only important in special education, nor only in the United States.

Over the past two decades, general- and special-education researchers from around the world have examined the use of data for educational decision making (see, for example, special issues of *School Effectiveness and School Improvement* [2012, v23(2)], and *Learning Disabilities Research and Practice* [2017, v32(1)]). Perusal of this large and diverse set of literature reveals significant overlap across educational fields and countries in the research questions addressed and the results obtained. Much could

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be gained by breaking down borders—between different fields and between countries—to stimulate the sharing of ideas and results. Such sharing is especially important for the education of students with or at-risk for LD. Decisions at every level of education—national, state, district, school, classroom, and individual—can have profound effects on the lives of these students.

Teachers Have Difficulty Using Data to Guide Instruction

Motivating this special series is a consistent and worrisome finding that has emerged in the DBI/DBDM research: Teachers have significant difficulty using data to inform and guide their instruction (see, for example, Black & Wiliam, 2005; Datnow & Hubbard, 2016; Espin et al., 2017; Förster et al., 2018; Fuchs & Fuchs, 1989; Keuning et al., 2017; Mandinach & Gummer, 2013; Raffe & Loughland, 2021; Schildkamp et al., 2012; Stecker et al., 2005; Young & Kim, 2010; Zeuch et al., 2017). This finding has been observed in research in special and general education, in research across different assessment systems and at different levels of educational decision making, and in research from different countries. The finding that teachers have significant difficulty using data to make instructional decisions is worrisome because merely “having” the data is not enough: Teachers must use the data to guide and inform instruction if they hope to effect improvements in student performance.

To successfully address the issue of teachers’ data use, researchers must pool their collective knowledge and resources to better understand the difficulties that teachers face in using data to make decisions, and then develop methods for addressing those difficulties. In this special series of JLD, we break down borders to bring together an international group of special- and general-education researchers to address teachers’ use of data to inform instruction, with a specific focus on instruction for students with or at-risk for LD.

Description of the Special Series

The specific aim of the JLD special series is to increase understanding of the challenges involved in teachers’ data-based instructional decision making, and to further the development of approaches for improving teachers’ ability to plan, adjust, and adapt instruction in response to data. The articles in this series span two issues of JLD. The first set of articles focuses on what teachers know or need to know to effectively implement DBI. The second set of articles focuses on the effects of data use on student achievement, and on factors that influence the relation between data use and achievement.

What Teachers Know or Need to Know

The series begins with a focus on what teachers know or need to know to effectively implement DBI. In the first article of the series, Oslund and colleagues examine teachers’ ability to analyze and interpret graphed progress monitoring data. Using structural equation modeling, Oslund et al. examined the impact of teacher training, experience, and confidence on teachers’ graph literacy. Data were gathered from a nationally representative sample of 309 teachers, and included latent variables related to teachers’ experience (e.g., years teaching, years working with multi-tiered instructional approaches), training (e.g., hours of DBDM professional development), and confidence (e.g., confidence in interpreting data, confidence in determining student response). In addition, data were collected on teachers’ data-based decision making skills and graph literacy. Findings revealed that experience and confidence predicted graph literacy, but training did not. Furthermore, whereas training increased teacher confidence, experience did not, and confidence did not mediate the effects of either experience or training.

In the second article of the series, Espin and colleagues provide a possible explanation for why professional development training may not improve teachers’ graph literacy. Espin et al. conducted a systematic review of Curriculum-Based Measurement (CBM) professional development materials to determine to what extent the data-based decision making aspects of CBM were emphasized in the materials. They defined data-based decision making as reading and interpreting progress graphs and linking the data to instruction. An analysis of 69 CBM professional development sources, including presentations, manuals, and books, revealed that only a small proportion of the content was focused on the data-based decision making aspects of CBM, and that this proportion was significantly smaller than (a) that devoted to other topics, (b) that expected were information to be equally distributed across topics, and (c) that recommended by experienced CBM trainers. The authors concluded that there was a need for increased attention to instructional decision making in CBM professional development.

In the third article of the series, Gesel and colleagues delve further into the effects of professional development. Gesel et al. conducted a meta-analysis on the effects of professional development targeting data-based decision making processes on teachers’ knowledge, skills, and self-efficacy related to CBM. The meta-analysis consisted of 28 empirical group design studies focused on professional development for in-service or pre-service K–12 teachers. Results yielded a significant mean effect size of $g = 0.57$, supporting the effectiveness of the professional development. The authors cautioned, however, that there was significant heterogeneity in effects across studies, and

that the studies reviewed occurred under ideal, researcher-supported conditions, potentially limiting the generalizability of the effects.

In the final article of this section, Blumenthal and colleagues report the results of a study comparing educators' use and understanding of key components of DBDM in Germany and the United States. Educators responded to a survey that asked about data use and about factors potentially related to DBDM. Results suggested that in both countries, educators used data to monitor progress, although less so in Germany than in the United States. Educators in both countries displayed similar understanding of important features of data (e.g., psychometric properties). Educators in the United States reported using data for decision making at the classroom level almost twice as often as their counterparts in Germany, while German educators focused more on decision making at the student level. The findings provide a basis for future international comparisons and for sharing of ideas and data across countries.

Effects of Data Use on Student Achievement

In the second set of articles in the series, our focus turns to the effects of data use on student achievement, and on factors that influence the relation between data use and achievement. This set of articles begins with a narrative synthesis by L. Fuchs and colleagues of the CBM instructional utility literature. The goal of the synthesis was to clarify the pattern of overall effects of data-based individualization (DBI) on the learning outcomes of students with intensive intervention needs. The authors first summarized a recent meta-analysis of CBM-DBI studies focused on student outcomes. They then reexamined the studies included in the meta-analysis to determine what supports were necessary for teachers to enrich instructional decision making within CBM-DBI and improve student learning. The authors concluded by proposing a renewed program of instructional utility CBM-DBI research that would capitalize on technology's potential to enhance instructional decision making for intensive needs students and that would fulfill DBI's potential.

In the following article, Peters and colleagues evaluate the effects of Learning Progress Assessments (LPAs), with or without teacher support, for low-performing readers in general education in Germany. LPAs are assessments that provide support to general-education teachers to adapt instruction to the needs of heterogeneous classrooms. Although previous research has demonstrated positive effects of LPAs (either with or without accompanying prepared materials) on the performance of students in general-education classrooms, results have not been examined separately for low-performing readers. Employing meta-analytic techniques, Peters et al. reanalyzed data from six earlier studies to examine the effects of LPAs on

the performance of low-performing readers. Findings from single studies revealed no positive effects of LPAs, with or without prepared material, on the performance of low-performing readers, but the integrated analysis revealed positive effect trends on reading fluency and intrinsic reading motivation for these students.

In the following article, Schmitterer and Brod examined teachers' identification of students in need of reading interventions. Specifically, the authors compared teachers' decisions about students' need for reading interventions to scores on standardized reading and spelling tests. They also examined how teachers reached their decisions. Results indicated that teachers' decisions about students' need for reading interventions overlapped more with scores from spelling assessments than with scores from reading assessments. Hierarchical linear models revealed that spelling was the strongest predictor of teachers' decisions, followed by advanced reading abilities, phonological awareness, and vocabulary. Furthermore, students in classes with higher mean achievement levels were more likely to be identified as needing reading interventions than equally able students in classes with lower achievement levels. The authors conclude that such biases—if not addressed—could lead to suboptimal assignment of children to interventions.

In the final article in the series, Devin Kearns integrates and reflects upon all of the articles in the series. In his reflection, Kearns highlights the most important findings across the studies, and creates an integrated model of the issues, challenges, and solutions related to teachers' data-based decision making for students with or at-risk for LD.

Conclusion

The articles in this special series highlight the challenges that teachers face in using data to guide instruction, provide potential explanations for why these challenges exist, and provide ideas and suggestions for ways to address these challenges. Addressing teachers' ability to use data to guide and inform instruction for students with or at-risk for LD is crucial. Data have been referred to as the "new gold" of society (see, for example, O'Halloran & D'Souza, 2020). Similar to gold, data are of no value in raw form. They must be mined and shaped, and done so with skill and precision, if they are to become a valuable asset to educational decision making.

What is clear from the research included in this special series is that if data are to positively affect the academic performance of students with LD, then researchers and teacher educators must find ways to help teachers mine and shape the data to better inform instruction. The potential that DBI holds to positively affect the lives of students with disabilities has never been more evident than it is in today's world, as educators struggle to deal with the effects of the COVID-19

pandemic. DBI could be used to track students' learning losses resulting from lockdowns and school closings, and to determine rates of recoupment in response to interventions once schools reopen. That said, the articles in this special series make it abundantly clear that the potential for DBI will only be realized if educators effectively use the data to inform instructional decision making, and, further, that educators are not likely to do so without specialized training and support.

In closing, we would like to thank the editor of JLD, Stephanie Al Otaiba, and her editorial team, for helping us to put together this special series. In addition, we would like to offer a special thanks to the Lorentz Center at Leiden University for sponsoring the scientific meeting that led to this special series, and for providing us the unique opportunity to come together to share findings and ideas. The Lorentz meeting spawned new collaborations and friendships, broadened views, increased our understanding of issues, and furthered the scientific research agenda surrounding DBI/DBDM in education and special education. And it led to the creation of this special series of JLD. We hope you enjoy it.

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