

DATA USE IN THE CLASSROOM

The Challenges of Implementing Data Based Decision-Making at the School Level

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Abstract: Systemic efforts to implement database decision-making at the school-level and classroom-level face several challenges. First, most data available within district information systems are limited to operational needs of schools and the district. Second, educational organizations have little experience integrating complex data into their decision-making processes. Third, while large-scale assessment and accountability data are more generally available for gauging the performance of educational systems, there are major differences between the evidence used for external accountability systems and the data needed for making instructional decisions on a daily basis in the classroom.

Key words: Decision support, educational management

1. INTRODUCTION

This paper will examine problems school-level staff encounter when attempting to implement data-based decision-making reform efforts, specifically those decisions that influence teaching and learning in the classroom. Many schools and districts are exploring data-driven decision-making as a solution for improving resource allocation and instructional program decisions. One of the most challenging problems policy makers and educators face in attempting to implement curriculum reforms is that intervention decisions are made at least one organizational level above that of the teachers - the persons actually engaged in instruction.

Any systemic effort to implement a focus on database decision-making at the school-level and classroom-level faces several challenges. First, most data available within district information systems are limited to what has been deemed important for the operational and accountability needs of schools and the district. These data include attendance, discipline, and basic demographic data. District systems will also contain detailed information about human resources, budgets, and other business processes. Typically, the only outcome data available are the results from centrally administered tests (which are often annual events) and grades. While this data is useful to help frame annual analysis of school-level, classroom-level, or student-level outcomes, it is inadequate for making mid-course or interim instructional decisions within a single grade/marking period.

Second, while the issues involved in successful database decision-making are just beginning to be discussed in the literature on educational administration and assessment, an important and growing body of relevant work is emerging from business schools around the world. These studies range from considerations of the role of experts in organizational learning (Albert & Bradley 1997) to multi-dimensional representations of the lifecycle of knowledge (Boisot 1998). Educational journals tend to be focused on application. For example, *School Administrator* recently published an entire edition (April 2001) dedicated to data-driven decisions. This work addresses systemic reform concerns that help to provide both the technical and information resources necessary to support school-level databased decision-making.

Third, while large-scale efforts to make assessment and accountability data more generally available do provide some insight into the performance of an educational system, there are major differences between the evidence used for external accountability systems and the data needed for making instructional decisions on a quarterly, weekly, or daily basis in the classroom. The large gap between the time horizons of state-level testing and the more immediate needs of program administrators and individual teachers in the classroom means that data needs and rules of evidence will be commensurately divergent.

2. APPROACHES TO UNDERSTANDING DECISION-MAKING AND KNOWLEDGE WORK

There is a growing literature on information seeking, information processing, and information use that provides insights into how individuals and groups identify information needs and then respond (or choose not to respond) to those needs. This work draws on and can be used to frame other

work in the areas of group decision-making, knowledge management, and the human factors of decision support systems.

One recent study of information seeking on the web provides an excellent synopsis of what the authors call an integrated model of human information seeking (Choo et al. 2000) summarizes this model. The important aspects of the model for this paper are intersections between the different behavioural areas – the identification of informational needs, seeking to fulfil those needs, and use of information to address the identified needs. The three points outlined in the introduction can be addressed through this model. I will use a school improvement team attempting to create an improvement plan for math instruction as an example case to illuminate several aspects of this information-seeking model. The anecdotes described in this case are taken from lessons learned from working with school improvement teams and from school improvement planning documents.

2.1 Information needs

First, the identification of information needs is a primary problem in any type of school reform or curriculum improvement. As indicated above, much of the data available from district information systems is limited to data useful to make district level decisions. The granularity¹ and temporal resolution² of the data available severely restrict its usefulness for different user groups. In the case of an effort to understand current performance and how that performance relates to school and district goals, the School Improvement Planning [SIP] team can examine district accountability reports for aggregate data and school-level and individual-level score sheets from math component of the annual standardized math achievement test and compare the results on these metrics to goals set by the school, district, and/or state for their desired or expected performance.

In this situation, the SIP team attempts to frame a problem in terms of a gap between the observed math performance of the students and outcomes targeted by the accountability goals. At this point, the problem has been

¹ Granularity is a term used to describe the level of aggregation of data. For example, attendance data could be listed as follows in increasing finer granularity – days absent this year, days absent this semester, days absent this week, or periods absent this day. The finer the grain size, the more detailed the analysis can be. The tradeoff however, is that the finer the granularity, the more data one must manage.

² Temporal resolution refers to the span of time to which a particular datum or data set refer. Annual test scores have the temporal resolution of one year. Weekly spelling test scores have a temporal resolution of one week. The temporal resolution of a particular type of data makes it more or less useful for measuring the state of or the change within a system over a given span of time.

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