Understanding Formative Instruction By Design

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Abstract: Formative instruction has proven to be a remarkably difficult practice to implement in schools. This paper explores teachers' thinking in their uses of a new data analysis tool to enact evidence-based instructional practices, describing possible relationships between teachers' existing beliefs, expertise, and routines and their construction of new practices. We show how current theories of assessment do not account for important aspects of formative instruction in practice.

Introduction

Despite considerable research about its importance, formative instruction (FI) has proven to be a remarkably difficult practice to implement in schools. FI refers to the practice of using evidence of student thinking and learning to responsively shape ongoing instruction to support content mastery by all students (Black and Wiliam, 1998b). Despite the recognition of FI's potential impact (Black & Wiliam, 1998a), we know little about how to enact it at scale.

This work explores teachers' thinking in their uses of a new data analysis tool to enact evidence-based instructional practices, describing possible relationships between teachers' existing beliefs, expertise, and routines and their construction of new practices.

Context of the Work

As part of a larger study about the integration of attention to literacy in content-area instruction, we created a set of online tools for participating teachers to use to analyze their own students' work, understand their students' thinking, and enact more responsive instruction. One of these online tools was annotation, which is the process of marking up a text in order to perform content analysis as well as reveal the meaning behind various textual features (Liu, 1996). As an activity that produces external representations about individual use of text, annotation seemed like an ideal window into student thinking. As part of the work, the teachers made annotation a routine component of reading in their classes.

We studied teachers' uses of the data analysis tools to observe their analytic strategies and how the specific cases of each teacher's particular enactment was related to his/her pre-existing routines, beliefs, and expertise. We analyzed each teacher's work qualitatively, using the Learning to Notice framework (van Es and Sherin, 2002) to identify important aspects of teachers' uses of information (how they called out details, interpreted those details, and reasoned about them using contextual knowledge) and the assessment triangle (Pellegrino, Chudowsky & Glaser, 2001) to characterize the kind of claims that teachers made, drawing comparisons between different segments within individual teachers' work (such as what they attended to and what claims they made during analysis) and between teachers.

In this poster, we will look at the work of two specific teachers, called Teacher1 and Teacher2. Both teachers were part of the same sixth grade teacher team at an ethnically and economically diverse Midwestern American K-8 school. Teacher1 taught science and social studies. Teacher2 taught English/Language Arts. Both teachers had about five years of teaching experience, most of it in the same school.

Genetic Model of Formative Instruction.

As depicted in Figure 1, the system of practice reported on is the product of combining a set of *Base Instruction Practices* (i.e., the set of instructional routines teachers already had), drawing upon *Base Beliefs & Expertise* and *Base Texts*, with outside reform messages, *Annotation* and *Formative Instruction*. Teachers then reified *Annotation* by creating a set of *Classroom Annotation Procedures*. We expected that the canonical ways of annotating that teachers constructed and prescribed would not be random, but instead, draw upon their existing routines, expertise, beliefs, etc. We anticipated that the ways they did so might parallel aspects of their existing practice. We wanted to understand how teachers drew upon these same base details when analyzing student work, reasoning about its implications for subsequent instruction, and teaching.
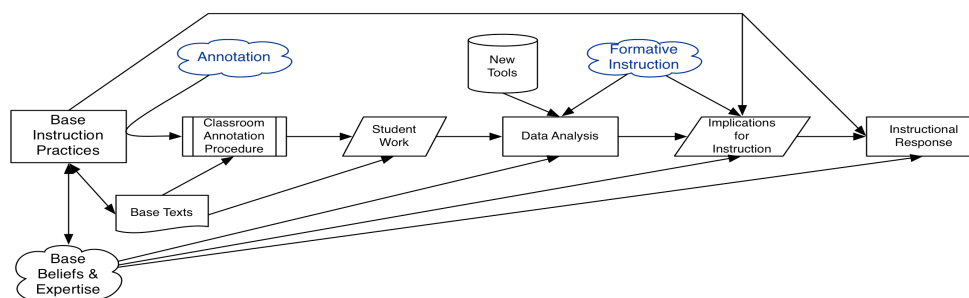
Figure 1. Model of Adaptation & Implementation

Case of Teacher1

Both teachers' adaptations of annotation seemed to mirror their base instructional practices and beliefs. Teacher1's adaptation of annotation was to instruct her students to annotate each section heading with a question inspired by the heading, and then to annotate any text within the following section that answered the question with a short comment. Teacher1's classroom instruction made frequent use of questions to elicit information about student thinking and she canonized annotation in a manner that was question-centric. Teacher1 discussed, in the abstract, the importance of engaging every student in instruction and, when she analyzed students' data, she attended primarily to evidence of students' engagement. At the same time, she could not conclusively determine from the data whether students correctly understood the texts' content. She noted that whether they did the annotation correctly was less important than whether they were engaged or not. In class, Teacher1 used her recollection of the data to reason about students' classroom participation and the effectiveness of her own instructional decisions.

Case of Teacher2

Teacher2's classroom instruction was primarily lecture driven, with Teacher2 delivering content in a manner he could know, a priori, to be the one best way. His adaptation of annotation was intentionally homogeneous, with all students expected to highlight the same details. His analysis of students' annotations was, accordingly, largely consumed with whether students annotated the right things. Whereas Teacher1 had regarded pinkness on the heatmap as "what you would expect", Teacher2 recognized it as problematic. He expected his students to annotate all of the same things (which would result in dark red shading). When Teacher2 noted mistakes in students' work, he did not seem to realize ways in which they possibly indicated other legitimate interpretations of text, even when his students explained their thinking to him.

Issues Raised

The purpose of the work here was to develop some rudimentary knowledge about how teachers could use annotation data to understand their students' thinking, how technological tools could help them to do so, and how teachers' choices about how to understand student thinking through annotation can be informed by teachers' existing routines and knowledge.

Indeed this work highlights further challenges to current assessment theory. For example, we can not assume that it is possible to know what mastery looks like, as many assessment theories assume. In addition, much of the current assessment theory ignores students' engagement and motivation. This is important since this information can be interesting and useful for teachers.

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