

Classroom Observation, Instructor Interview, and Instructor Self-Report as Tools in Determining Fidelity of Implementation for an Intervention

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Abstract. A web-based activity and testing system (WATS) has features such as adaptive problem sets, videos, and data-driven tools for instructors to use to monitor and scaffold student learning. Central to WATS adoption and use are questions about the implementation process: What constitutes “good” implementation and how far from “good” is good enough? Here we report on a study about implementation that is part of a state-wide randomized controlled trial examining student learning in community college algebra when a particular WATS suite of tools is used. Discussion questions for conference participants dig into the challenges and opportunities in researching fidelity of implementation in the community college context, particularly the role of instructional practice as a contextual component of the research.

Research Questions

- (1) What is the nature of alignment between how the program is implemented and how the developer/publisher envisioned it (i.e., what is the fidelity of implementation)?
- (2) What are the relationships among varying conditions of implementation (differing degrees of fidelity of implementation) and the extent to which students are achieving the desired results?

Background & Conceptual Framework

The theoretical basis for our approach lies in program theory, “the construction of a plausible and sensible model of how a program is supposed to work” (Bickman, 1987, p. 5). Having such a model in place allows researchers to conjecture and test causal connections between inputs and outputs, rather than relying on intuition or untested assumptions. As in many curricula projects, developers of the program in our study did attend to learning theory in determining the content in the web-based system, but the same was not true for implementation processes and structures. The pragmatic details of large scale classroom use were under-specified. Developers articulated their assumptions about what students learned as they completed activities, but the roles of specific components, including the instructor role in the mediation of learning, were not clearly defined. As Munter and colleagues (2014) have pointed out, there is no agreement on how to assess fidelity of implementation but there is a growing consensus on a component-based approach to measuring its structure and processes (Century & Cassata, 2014).

Fidelity of implementation is the degree to which an intervention or program is delivered as intended (Dusenbury, Brannigan, Faleo, & Hansen, 2003). This requires a careful articulation of what “as intended” means! Fidelity is rooted in the question: In what ways does the program-in-operation have to match the program-as-designed to be successful? For example, if a program calls for 15 hours of contact time, and only 10 are achieved, in what ways can the anticipated result still be reached? Do implementers understand the trade-offs in the daily decisions they must make “in the wild” and the short and long-term consequences on student learning as a result of compromises in fidelity? Century and Cassata’s (2014) summary of the research offers five core components to consider in fidelity of implementation: Diagnostic, Procedural, Educative, Pedagogical, and Student Engagement. The poster will illustrate each (also see Table, next page).

Method

The project’s research team has developed a rubric for fidelity of implementation, identifying measurable attributes for each component (for example, see the table, next page, for some detail on the “educative” component).

Educative: These components state the developers' expectations for what the user needs to know relative to the intervention.			
	High Level of Fidelity	Moderate Fidelity	Low Level of Fidelity
Users' proficiency in math content	Instructor is proficient to highly proficient in the subject matter.	Instructor has some gaps in proficiency in the subject matter.	Instructor does not have basic knowledge and/or skills in the subject area.
Users' proficiency in TPACK	Instructor regularly integrates content, pedagogical, and technological knowledge in classroom instruction. Communicates with students through WATS.	Instructor struggles to integrate CK, PK, and TK in instruction. Occasionally sends digital messages to students using WATS tools.	Instructor CK, PK, and/or TK sparse or applied in a haphazard manner in classroom instruction. Rarely uses WATS tools to communicate with students.
Users' knowledge of requirements of the intervention	Instructor understands philosophy of WATS resources (practice items, "mastery mechanics," analytics, and coaching tools),	Instructor understanding of the philosophy of WATS tool has some gaps. NOTE: Disagreeing is okay, this is about instructor knowledge of it.	Instructor does not understand philosophy of WATS resources. NOTE: Disagreeing is okay, this is about instructor knowledge of it.
Users' knowledge of requirements of the intervention	Instructor understands the purpose, procedures, and/or the desired outcomes of the project (i.e., "mastery")	Instructor understanding of project has some gaps (e.g., may know purpose, but not all procedures, or desired outcomes).	Instructor does not understand the purpose, procedures, and/or desired outcomes. Problems are typical.

Results

Our focus for the poster are the preliminary rubric results of data collected through observation, interview, and teacher self-report in weekly surveys (also known as “teaching logs”). From these, we may need to refine research tools (e.g., observation protocol, interview prompts, log items) as measures of fidelity. The purpose of a fidelity of implementation rubric is twofold: (1) to determine the degree of alignment between how the program is implemented and how the developer/publisher envisioned it and (2) identify conditions under which students are achieving the desired results. That is, what works, for whom, under what conditions? It provides the opportunity to discover where productive adaptations may be made by instructors, adaptations that boost student achievement beyond that associated with an implementation faithful to the developers' view. The factors included in this poster are meant as a starting point for conversation. They are not an assertion of a final collection of factors to be considered. The poster shares the theory behind the protocol and seeks to gather ideas from RUME attendees on revisions, additions, and deletions that might be productive as we move forward into the full study (2015 is a “practice” year for the study).

Implications for Practice

By definition, high fidelity implementation of an instructional tool is use that results in greater learning gains than non-use. Instructors and students are better equipped to implement with high fidelity when they have answers to questions like: What are the characteristics of good implementation? Among preferred actions in implementation, which are the highest priority? What are the trade-offs and consequences of making particular decisions about use of the tool? We seek advice from RUME-goers on effective ways to communicate implications to college instructors, department chairs, as well as stakeholders in the larger public arena.

References

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