Balancing Change and Understanding in Literacy Research through Formative Experiments

David Reinking and Janet Watkins
University of Georgia

There is a pervasive, albeit little-discussed, tension within the community of educational research, in general, and literacy research, in particular. That tension, which has much to do with the rationale for formative experiments, was made explicit to us several years ago by a colleague who conducts basic literacy research from a distinctly psychological perspective. She was presenting her work to a group of doctoral students in a literacy education seminar. She had requested the opportunity to do so in preparation for a forthcoming conference talk to an audience comprised mainly of teachers. Her concern was that her basic psychological research might not be interesting or relevant to classroom teachers, and she was seeking an opportunity to hone her presentation in that direction by presenting first to doctoral students whose backgrounds and interests were more closely connected to classroom practice. In explaining her purpose to the students she began by saying something like this: “Literacy researchers tend to be more interested in changing the world, while educational psychologists like me tend to be more interested in understanding how the world works.”

Her comment suggests that educational research is a somewhat schizophrenic enterprise that entails either a passionate commitment to making things tangibly better for students, teachers, and society and a more dispassionate commitment to research as a rigorous exercise in seeking deep understandings. We do not think our colleague wanted to push that generalization too far and neither do we. Pitting a change-the-world orientation against an understand-the-world orientation risks creating a false dichotomy because these perspectives are clearly not mutually exclusive. Most literacy researchers claim, at some point, to be seeking both goals simultaneously. Indeed, our colleague’s presentation illustrated that she was quite capable of seeing how her research originating primarily from an understand-the-world perspective might have implications for changing the world of instructional practice.

Nonetheless, preferred research methodologies and orientations tend to nudge those who adopt them more in one direction than in another. This tendency can be seen at the level of our entire field, as well as at the level of the individual researcher. For example, prior to the late 1980s the scientific, experimental paradigm was virtually the only option for serious researchers, which tilted our collective orientation towards theory-driven understanding based on presumably objective...
findings derived from quantitative data. Today, when many more methodological options are used and accepted, an individual researcher's preferred approach to research is more likely to reflect his or her personal leanings toward changing versus understanding the world. In fact, some have gone so far as to rely on research methodologies in ways that are at least tangentially related to this tension. For example, we recall hearing Lincoln (1990) describe quantitative methods as "rape-oriented" and qualitative methods as "lover-oriented." Although this statement may be extreme, it reflects the soul searching and debate in many quarters today concerning how educational research should be conceptualized and conducted. To some extent, the heated debates about paradigms, methodologies, and epistemologies, what has been referred to as the "paradigm wars," have a strong undercurrent of the change-versus-understanding-the-world tension.

A formative experiment, as an approach to literacy research, brings this tension to the forefront because positive change in educational outcomes is the primary focus of formative experiments. Yet, those who conduct formative experiments realize that they must draw on all of their resources as researchers for the deep understandings needed to effect positive change in teaching and learning that takes place in the complex environments of classrooms and schools.

In the past several years we have collected a set of quotes that promote perspectives on educational research that are especially in tune with formative experiments, although the writers were not addressing formative experiments in particular when they made these statements. We offer a few of them here in the hope that they might serve as an efficient way to identify the issues to which formative experiments respond especially well:

Education is not in need of research to find out how it works. It is in need of creative invention to make it work better. (Ebel, 1982, p. 18)

The study of how educational interactions work can never be far removed from the task of engineering them to work better. (Newman, Griffin, & Cole, 1989, p. 147)

[The major aim of educational research] has to do with the improvement of educational practice so that the lives of those who teach and learn are themselves enhanced. We try to understand in order to make our schools better places for both children and adults who share their lives there. (Eisner, 1993, p. 10)

Viewing research findings as something to be handed down as technical information ignores the reality that teachers must make strategic decisions about when to apply findings, how to adapt them to certain situations and even when it might be appropriate to ignore the findings altogether. (Duffy, 1994, p. 19)

Classroom life, in my judgment, is too complex an affair to be viewed or talked about from any single perspective. Accordingly, as we try to grasp the meaning of what school is like for students and teachers, we must not hesitate to use all of the ways of knowing at our disposal. (Jackson, 1990, pp. xxi-xxii)

In short, formative experiments are especially well suited to investigating how complex educational environments can be enhanced by determining what works in furthering valued pedagogical goals in a particular context through the collection of diverse data. Put another way, formative experiments are driven primarily by an interest in what could be, yet they acknowledge explicitly that what could be is dependent upon a deep understanding of what is. Formative experiments place high value on conducting research that is socially relevant (Reevies, no date; see http://www.hbg.psu.edu/bsed/intro/docs/dean/) while drawing on a variety of methodologies and data that may be relevant to promoting positive change. Thus, the tension between changing and understanding the world coalesces into a harmonious whole.

What Exactly is a Formative Experiment?

But what exactly is a formative experiment? Before addressing that question, we must highlight a few important disclaimers. First, we wish to emphasize that our explanation represents a somewhat personal view. The literature explaining formative experiments is very thin and our conception is derived as much from our own experience as it is from what others have written. To our knowledge, besides three of our own previous publications on the topic (Baumann, Dilton, Schockley, Alvermann, & Reinking, 1996; Reinking & Pickle, 1993; Reinking & Watkins, 1996), there are only two published sources that attempt to define formative experiment explicitly. Jacob (1992) in a chapter published in The Handbook of Qualitative Research devotes only about two pages to formative experiments. The other publication, the one that originally piqued our interest in using this approach, is Newman's (1990) article in Educational Researcher where he describes what a formative experiment is and how he and his colleagues employed one to investigate whether computer-based activities might generate more analytical scientific thinking among middle school students.

Our understandings about and definition of formative experiments are admittedly extrapolations of these sources based on our own attempts to put relatively generally stated principles into practice. So, part of our enthusiasm for the NRC session on formative experiments, for which we wrote this paper, is that we expected it to allow us to bring into sharper focus our own understandings of formative experiments.

A related disclaimer concerns how formative experiments compare with other approaches to classroom research. As we explain in a subsequent section, it is relatively easy to distinguish between the types of research questions that can be addressed by formative experiments when compared to general categories such as conventional experiments or qualitative research. However, there are other approaches to research that overlap with the purposes and goals of formative experiments. A formative experiment is related to but not yet clearly distinguishable from approaches to research such as situated evaluation (Bruce & Rubin, 1993), design experiments (Brown, 1992), formative evaluation (Flagg, 1990), and rapid prototyping (Tripp & Bichelmeier, 1990). Each of these approaches has been identified specifically as approaches aimed at creating positive change. However, each approach lacks one or more characteristics of formative experiments as we conceptualize them: formative experiments are clearly focused on
An example of a Formative Experimentation

A formative experimentation is a method used in educational research to design and develop educational materials. It involves the use of experimental designs to evaluate the effectiveness of educational interventions. This approach is particularly useful in identifying areas for improvement in existing educational programs.

In the context of reading comprehension, formative experimentation can be used to assess the impact of different instructional strategies on student learning. Researchers may conduct formative experiments to determine which teaching methods are most effective in helping students develop reading skills.

For example, a study might compare the effectiveness of traditional reading instruction with that of a more interactive, technology-based approach. By collecting data on student performance before and after the intervention, researchers can determine which method leads to greater gains in reading comprehension.

The results of formative experiments can inform future instructional decisions and help educators make evidence-based choices about how to best support student learning.
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