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ABSTRACT

This paper examines the purpose, function, and legitimacy of action research as a methodology that encompasses a complex, authentic view of scientific inquiry. A historical account of action research is presented with a focus in how it merged theory with practice. Cultural historical activity theory (CHAT) is used as a theoretical rationale for action research. L. Vygotsky's zone of proximal development and the role of semiotic cultural tools in the transformation of student and teacher cognition during classroom action research are discussed. These CHAT theoretical concepts are illustrated using data collected during a classroom action research study. The paper concludes with a call for new research questions from a mediational action research perspective that would address how teachers select and adapt methods and materials to fit their classroom contexts. (Contains 1 figure and 28 references.) (Author/SLD)

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Does Action Research Count as Scientifically-Based Research? A Vygotskian Mediational Response

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Abstract

This article examines the purpose, function and legitimacy of action research as a methodology that encompasses a complex, authentic view of scientific inquiry. An historical account of action research is presented with a focus on how it merged theory with practice. Cultural historical activity theory (CHAT) is used as a theoretical rationale for action research. Vygotsky's zone of proximal development and the role of semiotic cultural tools in the transformation of student and teacher cognition during classroom action research are discussed. These CHAT theoretical concepts are illustrated using data collected during a classroom action research study. The paper concludes with a call for new research questions from a mediational action research perspective that would address how teachers select and adapt methods and materials to fit their classroom contexts.

Does Action Research Count as Scientifically-Based Research?

A Vygotskian Mediational Response

Bridging the research to practice gap has been a primary concern for educators and policy makers over the past two decades. The call for practices that use research-based programs is evident, from the Reading Excellence Act of 1988 to the current accountability milieu of *standards-based reform* (SBR). The No Child Left Behind Act of 2001 contains over 100 references to the term, "*scientifically-based research*" (SBR). An attempt to address the purpose, function and legitimacy of action research within this SBR context begs the question, "***Whose science?"***

The National Research Council (NRC) addressed this question in the report, *Scientific Research in Education* (National Research Council, 2002). To explain the nature of scientific research in education, the report compiled the following set of six epistemological guiding principles for scientific inquiry:

1. Pose significant questions that can be investigated empirically
2. Link research to relevant theory
3. Use methods that permit direct investigation of questions
4. Provide a coherent and explicit chain of reasoning,
5. **Yield findings that replicate and generalize across studies, and**
6. Disclose research data and methods to enable and encourage professional scrutiny and critique. ((Feuer, Towne, & Shavelson, 2002. p. 7)

The report further stated that the research method or design must match the research question addressed as follows:

- What is happening (description);

- Is there a systematic effect (cause); and
- **Why or how is it happening (process or mechanism)?** [1] (Feuer et al., p. 7)

Although the NRC authors offered these guiding sets of epistemological and methodological principles as a means of fostering consensus among educational researchers, it is quite likely that these efforts could actually "fuel the fires" in the on-going, somewhat tiresome Positivist vs. Postmodernist, or quantitative vs. qualitative debate (St. Pierre, 2001). In response to the NRC report (National Research Council, 2002), other researchers acknowledged a more complex, realistic view of what scientists do and the uncertainties with which they wrestle. This includes the complex, contextualized nature of educational research and the variety of local contexts within which educational research is conducted (Berliner, 2002; Erickson & Guiterrez, 2002), as well as the need to include practitioners in order to reach collaborative understandings of educational contexts in both practical and theoretical ways (Pallegrino & Goldman, 2002).

An Historical Account of Action Research

Action research in education was introduced in the 1040s with the same intentions as SBR movement in the 1990s, (e.g., to solve practical problems in school settings through the convergence of theory and practice). Kurt Lewin used the term *action research* in the 1940's to describe the application of social science inquiry methods to improving practice in schools by solving practical problems and contributing to theory and knowledge in education (Oja & Smulyan, 1989). Inherent in Lewin's

[1] Epistemological principle #5 on generalizing findings and methodological principle #3 on process research questions regarding why or how a phenomena is happening are of particular interest to a Vygotskian, Cultural-Historical Activity Theory (CHAT) perspective on action research.

description were the dual purposes of putting theory into practice and creating theory out of practice.

Stephen Corey led the early action research movement in the 1940's focusing on the purpose of putting theory into practice. The rationale was that if teachers were drawn into the research process, they would feel a sense of "ownership" of theory and innovations and use them to create changes in practice (Corey, 1953). Results of these early efforts did not directly lead to changes in schools by putting theory into practice. Instead, the results could have accomplished more toward creating theory out of practice because the teachers chose to examine questions dealing with children's social interactions and changes in attitudes (Foshay, 1994). These questions were considered to be more theoretical in nature because they related to cognitive development and learning and, therefore, more conducive to investigations using controlled analytic research methodology rather than action research.

Action research resurfaced in the 1980s, but this time with a focus on the dual purposes of putting theory into practice and creating theory out of practice. Cognitive theory and research expanded beyond learner cognition to include examination of teacher cognition related to knowledge and beliefs about students, subject matter and classroom teaching strategies (Kagan, 1990; Lampert & Clark, 1990; Patterson & Shannon, 1993; Prawat, 1991). Through reflective inquiry, teachers considered which *general theories*, knowledge and beliefs to accept and how to deal with educational issues as they construct and reconstruct their *personal theories* of teaching, while they simultaneously restructured their classroom practices (Cole & Knowles, 2000; Wells, 1993). With reflective inquiry, the theory-to-practice gap becomes localized to

incongruities between the teacher's own theories (which are likely informed by global, general educational theories) and her own practical actions.

Most recently, the theoretical versus practical research dichotomy has been addressed through collaboration efforts between academics and school professionals. In both action research and participatory instructional design, reflective practitioners evaluate the use of materials and methods in within their own local contexts (Arhar, Holly, & Kasten, 2001; Cole & Knowles, 2000; Scharwtz, Lin, Brophy, & Bransford, 1999; Wells, 1993).

A Vygotskian CHAT Perspective of Action Research

Vygotsky's theory emphasized the role of education in human development. From this perspective, researchers who study how humans developed must consider the individual along with the social and material environment with which the individual interacts. Wells and Claxton (2002) explained Cultural-Historical Activity Theory (CHAT) as the theory of the mutually constitutive relationship between the individual and human society. Culture plays a key role in development of the individual's mind, and the individual's thoughts and actions in turn maintain and further develop the culture. Central to this interplay between the individuals' and the culture's development are the artifacts, cultural tools, humans create and use collectively in their everyday activities (Cole, 1996; Vygotsky, 1978; Wertsch, 1998).

CHAT encompasses the idea that Individuals' identities, values and knowledgeable skills are formed through their participation in activity systems in family, school, etc. Further, these activity systems provide the site for maintaining and reproducing certain aspects of the culture of which the systems are a subset, as well as

the site for potential renewal and change (Cole, 1996; Wells, 2000). As activity systems, the school and classroom would function as an appropriate site for conducting educational research. Also, that research would provide a means of analyzing teaching and learning beyond the transmission of knowledge and skills to the creation of knowledge, thus merging theory and practice.

Two key features of Vygotsky's theory of cognitive development and CHAT are particularly applicable to classroom action research. First, his investigations of the zone of proximal development included the learner's mediated performance in problem solving activities (Vygotsky, 1978). His zone concept addressed the interaction of teaching and learning as the teaching and learning both evolve simultaneously during socially mediated instruction. Vygotsky's use of student problem solving to study the learner's cognitive development can also be applied to teacher problem solving to study classroom teaching. Second, his experimental design was dynamic with the problem, method, and analysis continuously evolving as the research study proceeded (Vygotsky, 1986). Similarly, the social mediation employed by the action research teacher during instruction varies with each classroom's social environment and with the individual teacher's experiences. The teacher and learners bring their past experiences to jointly construct new solutions and knowledge that go beyond their past experiences. Therefore, a model for teaching and action research must also be a dynamic model within which the teacher's observations, analyses, decisions and actions continuously evolve (Dixon-Krauss, 1996b, 2000).

A Mediation Model Design of Action Research

A dynamic mediation model design has been particularly useful for classroom

action research (Dixon-Krauss, 1996a; 1996b; 2001). The primary goal of the action research design was personalized instructional change for the teacher (see Figure 1). Teacher-researcher collaboration was essential in each of the three components of the model: (a) identifying the problem, (b) implementing instruction, and (c) evaluating the teaching-learning situation. Classroom observations and professional literature were analyzed to identify the problem (incongruities between the teacher's personal theories and general educational theories found in the literature); learning activities and data sources were applied to implement instruction; shared meanings and teacher support were evaluated to determine how to adjust mediation.

The research studies cycled and recycled through the three model components, making the analyses an on-going continuous process. The focus of the analyses was twofold: a) the progression of how the classroom social mediation was affecting **students' thinking and literacy learning**, and b) how the **teacher's knowledge and personal theories** about teaching and learning develop while they are used in practice. The research problem, method and analyses continuously evolve as the studies cycle and recycle through the steps of the model.

Cultural Tools in Action Research

The role of artifacts, cultural tools, in CHAT theory is central to understanding how humans learn through mediated performance (see Cole, 1996; Wertsch, 1998 for a complete discussion). These tools can be materialistic, such as a baseball bat, or non-materialistic such as language. Vygotsky (1981) pointed out that material and nonmaterial tools can be semiotic in nature (e.g., numbers, charts, works of art, diagrams). Cultural tools are used to mediate and extend human activity, and use of the

tool produces transformations in the users' minds as well as in the artifact itself. For example, the most obvious tool used in classroom literacy practices is the *book*. Over time, it has encompassed transformations from slate -> to paperback -> to e-books, while its users have also transformed their knowledge bases and reading "skills."

The transformative nature of cultural tools when they are used in schools and classrooms brings into question the National Research Council's guiding principle #5 that requires scientific inquiry to conform to ***replication*** and ***generalization across*** studies (Feuer et al., 2002). This would require the cultural tools, methods, and materials to remain static rather than becoming transformed and locally adapted with use. Instead, from a CHAT perspective, scientific inquiry would yield findings that explain how the cultural tools, methods and materials produce and go through a process of ***transformation*** and ***adaptation into contexts***.

Wertsch (1998) examined the transformation of cultural tools in terms of their **affordances** and **constraints** on the users' actions. Action research provides a methodology for examining how the cultural tools are transformed as they are used in the learning context, and how the teacher's and students' thinking are also transformed in this process. Consider the following example:

> In an action research study conducted in a ninth grade English classroom (Dixon-Krauss, 2002), the teacher used a list of target vocabulary words with a test taken from a novel she was teaching as a record keeping tool. Initially the word list enabled the teacher to identify and track which words the students were learning – an ***affordance***, although she was not sure the word list contained all words her students needed to learn – a

constraint. She gave the list to the students and told them she would give them a matching test on the words with definitions, thus sharing or transferring the record keeping tool over to them – an ***affordance***. As the classroom learning activities moved into using concepts from the novel in discussions and writing, the students affirmed that the word list with test was transformed into a "meaningless rote exercise" – a **constraint.** Eventually the teacher restructured her vocabulary practices and assessment to include the students' written responses to the novel and relinquished the word lists with definitions matching test.

Conclusions

The alignment of research with practice might be accomplished by redefining scientifically-based research to include both the CHAT perspective and practitioner research methods such as action research. It is interesting to note that extending the educational research community to include multiple perspectives would actually require reducing the "reductionist" NRC principles for scientific inquiry to include only #2 and #6 (Feuer et al., 2002). If we could focus on linking research to relevant theory and encouraging professional critique, a more inclusive and realistic view of science would emerge. This view would encompass what teachers do, what scientists do, and the complex uncertainties educational researchers must deal with in classroom contexts.

A more authentic view of scientific inquiry would definitely require new questions for educational researchers. For example, the "quest for the ideal method" for teaching reading seems to be a bit ridiculous (Allington, 2002). If we concede that our cultural tools used to mediate teaching and learning are in a continuous state of transformation,

adaptation and evolution through use, the question must be restructured. Instead, the questions become, what are the appropriate methods or materials for use with whom? in what contexts?

Action Research would provide a powerful research methodology to address these questions from a CHAT theoretical perspective. When a mediational research perspective is employed, the research focuses on conducting systematic analyses of how teachers select and adapt methods and materials to classroom practice, and how those adaptations affect students' learning (Dixon-Krauss, 1996a, 2001). By merging CHAT theory with Action Research methodology, bridging the research-to-practice gap could occur at the practitioner, local level through professional collaboration.

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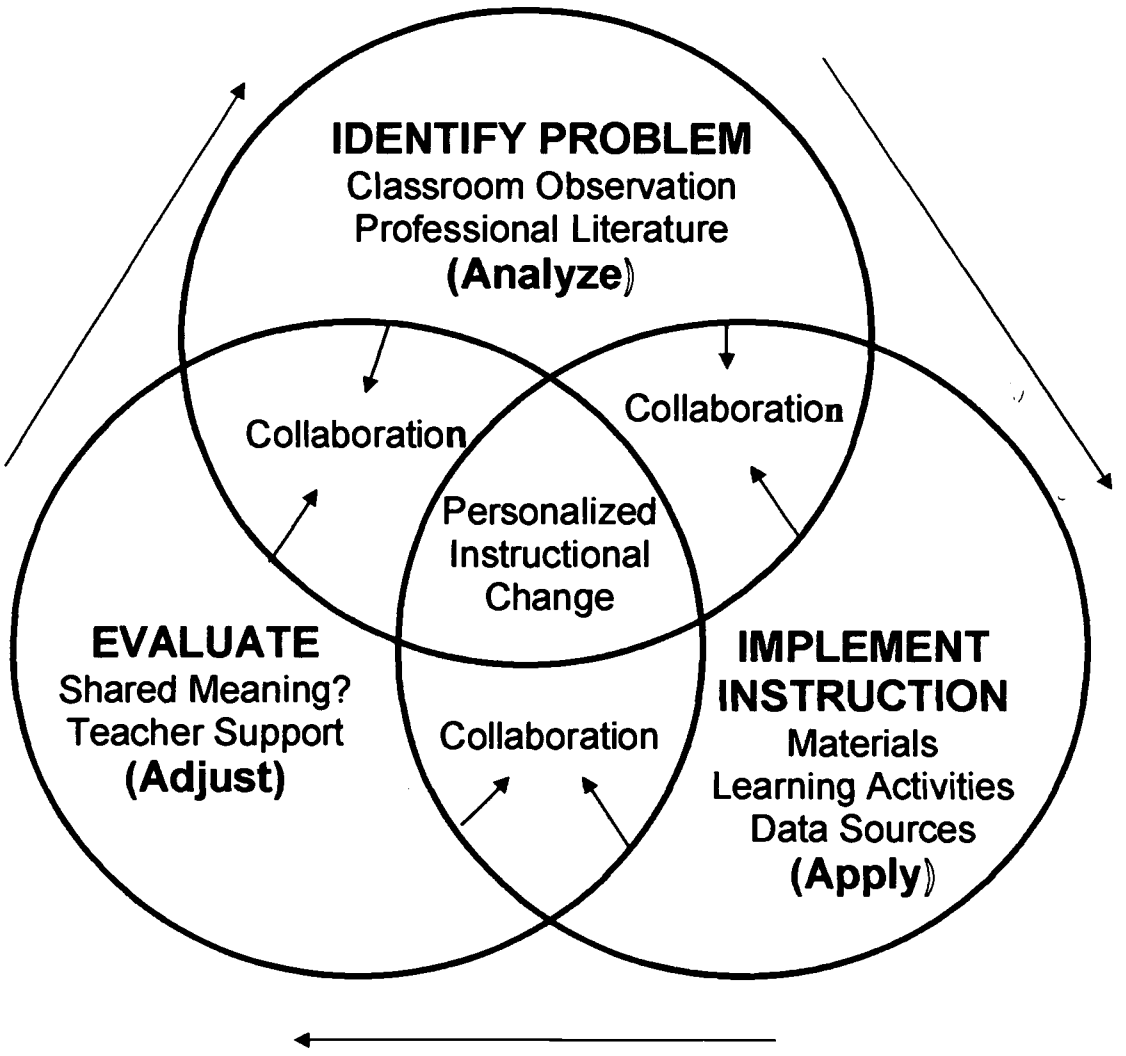
Figure 1. *Mediation Model of Action Research*



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