DOCUMENT RESUME

ED 473 209 RC 023 895

TITLE	Theoretical Framework for the Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics (ACCLAIM).
INSTITUTION	Ohio Univ., Athens. Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics.
PUB DATE	2002-11-25
NOTE	5p.
AVAILABLE FROM	For full text: http://kant.citl.ohiou.edu/acclaim/about/about_assets/Final%20Framework10-16-023.pdf.
PUB TYPE	Opinion Papers (120)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Context Effect; Educational Needs; *Institutional Mission; *Mathematics Education; Mission Statements; Research Needs; *Role of Education; *Rural Education
IDENTIFIERS	Capacity Building

ABSTRACT

This statement abstracts the theoretical framework for the Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics (ACCLAIM). ACCLAIM's mission is the cultivation of indigenous leadership capacity for the improvement of school mathematics in rural places. The mission addresses local organizational ability to (1) understand the rural context as it pertains to learning and teaching mathematics, and (2) articulate the meaning and utility of that learning for and by rural people. Ideally, developing important mathematical processes within the rural context involves modeling the features of natural and social existence (in mathematical terms), solving problems (in mathematical mode), reasoning inductively from data and deductively from assumptions, and knowing oneself mathematically (engaging in mathematics culturally and personally with consideration for both the cognitive and affective domains). Promoting such mathematical processes will hypothetically allow ACCLAIM to embed mathematical meaning within rural contexts. Sadly, educators and researchers too often regard the rural context as a deficiency from which students should somehow be rescued. Alternatively, context can represent a contradictory lifeworld potentially filled with meaning and interest deeply relevant to learning and teaching mathematics. A system of schooling responsive to rural issues could help students and teachers realize the variety of meaningful mathematics latent in rural lifeworlds. Some aims and general topics of a future research agenda are outlined. (Contains 14 references.) (SV)

Theoretical Framework for the Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics (ACCLAIM)

revision of 11.25.02

Précis

ACCLAIM's mission is the cultivation of *indigenous leadership capacity* for the improvement of school mathematics in rural places. The project aims to (1) understand the rural context as it pertains to learning and teaching mathematics; (2) articulate in scholarly works, including empirical research, the meaning and utility of that learning and teaching among, for, and by rural people; and (3) improve the professional development of mathematics teachers and leaders in and for rural communities.

Theoretical Framework

The following statement abstracts the theoretical framework for the Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics (ACCLAIM). ACCLAIM's mission is the cultivation of *indigenous leadership capacity* for the improvement of school mathematics in rural places. It is informed by a number of more extensive works (e.g., Bush, 2002; DeYoung, 2002; Howley, 2002a, 2002b; Schultz, 2002).

The mission addresses local organizational ability to (1) understand the rural context as it pertains to learning and teaching mathematics and (2) articulate (in written works) the meaning and utility of that learning *in, for, and by rural people*. Such inquiry - and particularly the habits and dispositions of such inquiry - is relevant to developing a capacity for realizing better, or truer, mathematics education in rural places.

Ideally, developing important mathematical processes within the rural context involves:

- modeling the features of natural and social existence (in mathematical terms);
- solving problems (in a mathematical mode);

  ---manipulating the language, symbols, and conventions of mathematics as needed for problem-solving;

  ---understanding the mathematical concepts and practicing the mathematical skills that underlie problem-solving;

- reasoning inductively from data and deductively from assumptions; and,

- knowing oneself mathematically (engaging in mathematics historically, culturally, and personally, with consideration for both the cognitive and affective domains).

Promoting such mathematical processes will hypothetically allow ACCLAIM to embed mathematical meaning within rural contexts.

Contextual features, however, such as mandated testing, available textbooks, inadequate funding, and the expectations and experiences of rural parents influence what actually happens in mathematics classrooms in rural schools (Campbell & Silver, 1999; Schultz, 2002).

Sadly, professional educators and researchers too often regard context as a *deficiency* from which students and their communities ought, somehow, to be rescued. This observation is particularly salient in the case of rural and urban settings. Too often, rural school leaders, rural teachers, and rural students themselves end by "blaming the victim." They presume an inherent cultural inadequacy accounts for their improper difference from the mainstream. And too often, researchers fail to challenge the stereotype and the distorted thinking that accounts for it.

Alternatively, context can represent a contradictory lifeworld (Habermas, 1987) potentially filled with meaning and interest that are *deeply relevant* to learning and teaching mathematics. In this regard, rural context is as complex, meaningful, and interesting as other contexts. A system of schooling responsive to rural issues can potentially help students and teachers realize the variety of meaningful mathematics latent in the lifeworlds of rural places.

We believe that future research into mathematics education in rural places should:

1. describe the salient relationships between mathematical knowledge and rural context;

2. examine rural schools as they serve or subvert the development of mathematical knowledge and expertise within the rural lifeworld;

3. examine hypotheses about the place occupied by mathematics knowledge in and (prospectively) *for* rural communities; and,

4. elaborate theories of, and knowledge about, "pedagogy of place" for mathematics education in rural schools.

Although, from this vantage, it is premature to set and pursue an *explicit research agenda*, individual ACCLAIM scholars bring questions from their established intellectual commitments relevant to ACCLAIM's research mission, for instance:

- How does educational *scale* (classroom, school, district, state size) influence mathematics learning and teaching?
- What intellectual significance do typical rural parents attach to mathematics and to mathematics education in rural schools and what are the implications for rural school improvement?
- How does rural context, particularly Applachian rural context, affect beliefs about, attitudes toward, and performance in mathematics?
- How does rural context, particularly Appalachian rural context, affect the nature of instruction, teacher preparation, and teacher development in mathematics?
- What characterizes effective professional development teams in mathematics education in rural schools and how can such effectiveness be cultivated and sustained?
- What policies would enable a pro-community mathematics education friendly to rural places?

The challenge to place mathematical knowledge in rural context is so sharp it has very seldom been attempted (Howley, 2001). Indeed, the challenge of such work may be greater in *conceptual* than in practical terms because rural areas around the globe, and throughout recorded history, have long played subservient economic, cultural, and (certainly) intellectual roles to very powerful urban, imperial, and now, cosmopolitan prerogatives (see, e.g., Inverness Research Associates, 2001; Jacobs, 1984; Williams, 1973, 1989).

Perhaps the difficulty lies not only with the challenge, but also with the lack of forces dedicated to addressing it. While there have been strong advocates on behalf of "underrepresented" groups—including women, people of color, and urban people—it is more difficult to identify such leadership on behalf of rural populations, both inside and outside the academy (DeYoung, 1991; Schultz, 2002).

Mathematics is increasingly recognized as the liberating and transcendent knowledge that it really is. We believe that everyone can grasp such knowledge to the intellectual, political, and practical benefit of the common good.
We also maintain that mathematics – as powerful an intellectual tool as writing and reading (see Moses and Cobb, 2001) – can help articulate and activate alternative rural futures better than it so far has. Surely mathematical thinking can be used to offer one interpretation of what the necessary work might be.

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