

Rural Research Brief

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Rural Science Education Research and the Frameworks that Give it Form

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Research in science education has evolved rapidly over the past ten to twelve years due to the growth of two components of most published research. Though it might be argued that they are not really new, these two components are today necessarily explicit whereas they were more implicit in the past. As a doctoral student and young researcher in the mid 1980s, I did not declare anything about my perspective on research or knowing other than the fact that a p value of less than or equal to 0.05 was required for my findings to be *significant*. But the doctoral students and young researchers of today are not able to get away with this. This is true for good reason. As research has become increasingly qualitative and constructivist, the idea that describing precisely the theoretical base from which our work grows has taken on much greater significance, thus we have had the term “theoretical framework” incorporated into the lexicon of educational research. Likewise, if we are conducting research for which our primary data sources are interviews and observations, it becomes necessary to describe how we will know when we have found a result that has meaning or perhaps importance. And the “how do we know” questions fall under the heading of epistemological framework. Thus we have a partner for the theoretical framework: the epistemological framework.

Do these two frameworks have any special significance for rural education research? Yes, I believe that they do. Recently I published a chapter in the *Handbook of Research in Science Education* under the title “Rural Science Education” (Oliver, 2007).

Like so many people who have written about rural research in the recent past, I again struggled with the definition of what is and what is not rural. I again looked at the definitions that have been used to identify a rural school. And like so many researchers in the past, I concluded that we can know rural schools when we enter them, but it is not always easy to create a description of them that can be widely applied.

The typical definitions of rural schools or rural places involve demographic characteristics or distances from cities. For instance, the U.S. Census Bureau defined rural as ‘a residential category of places outside urbanized areas in open country, or in communities with less than 2,500 inhabitants, or where the population density is less than 1,000 inhabitants per square mile’ (Stern, 1994 cited in Horn, 1995). Other authors have used

factors such as “isolation” as a measure (Sampson-Cordle, 2001). But isolation is a state of being that is increasingly difficult to attain. Cell phones and satellite TV make almost everyone within range of everyone else. For some groups, isolation has to be self imposed. For instance, in a recent issue of *The Atlantic*, Hirschorn (2007) described an episode of the ABC TV show “Wife Swap” in which a Pentecostal couple swap partners with a family in which the husband “has turned from God to follow his rock-and-roll dreams.” And as Hirschorn reported, the show takes quite seriously the “rejection of contemporary culture” by the Pentecostal family although they have apparently not rejected it enough to not be part of a reality TV program. In the same way, Crockett’s (1999) study of science education in an Amish Mennonite community demonstrated how a group can impose a choice to live in a rural area without television, radio and other sources of modern culture while maximizing the use of computers and high technology (such as using artificial insemination for breeding of cattle) when it is economically expedient to do so in the business side of their lives.

Horn (1995) described the problem of identifying rural schools in this way; “The simple fact is that rural people, rural communities and rural conditions are so diverse that one can find evidence to support nearly any characterization” (p. 3). Rural schools and rural communities are in some cases identifiable because of their distance from a city, population density, apparent isolation, availability of resources, homogeneity of population, and similar characteristics, but in some cases they are not. Rural is often a one word description of a school based on the school’s site and little else. In writing the chapter for the *Handbook of Research on Science Teaching*, I considered several examples of research on rural schools and considered the degree to which the authors built a description that might allow readers to understand the theoretical framework of rural education research to which that research adhered. I did not (and do not now) intend any negative criticism of these studies. I am simply interested in the representation of rural as an aspect of the framework driving the study.

In one example, Bradford and Dana (1996) published an article titled *Exploring Science Teacher Metaphorical Thinking: A Case Study of a High School Science Teacher*. Although the

authors did not use the term rural in the title of the research, it was a descriptor applied to the district. It does not appear anywhere else in the manuscript and thus has little bearing on the research or its findings. And yet, it seems to be somehow important if the authors provide any mention at all. On what basis was the district a rural school district?

Another example comes from an article by Gilbert and Yerrick from 2001. In this article, rural does appear in the title: *Same School, Separate Worlds: A Sociocultural Study of Identify, Resistance, and Negotiation in a Rural, Lower Track Science Classroom*. The work describes how the African-American component of the student body is bussed from a nearby town. And it is clear from the description of the African-American community in that town that it does not have many characteristics of a rural place. The authors described the school in this way:

Ridgemont High School is situated 10 miles outside a North Carolina university town of approximately 50,000 and attracts students from both rural-agrarian and small suburban settings. The boundaries of Ridgemont High School are drawn in response to a 1990 decision by the local school board to racially rebalance the school's attendance area by busing kids from predominantly Black neighborhoods within the town limits to predominantly White schools in the other areas of the county (p. 577).

This is an excellent study of how the students within the lower track science classes manipulate the environment of the classroom in order to reduce the learning demands that the teacher was intending for them. The students seem to have perfected a procedure by which they spiral down the expectations of the teacher and "maneuver the teacher to accept work that was only marginal with regard to the original teacher-stated goals" (Oliver, 2007, p. 354).

But the question of greatest interest here is: Is this an example of rural education research? The research questions were built within a rural framework. For instance the first research question read: "What are key components of lower track science classroom discourse specific to rural contexts?" However the rural context did not persist into the discussion and conclusions. The researchers found that there was no shared discourse between the lower track students and their teacher. As a result they concluded: "Instead of sharing a common discourse, lower track students and their teachers maintain separate discourses that are carved in response to and in opposition to the world view of the other (p. 594)."

I have always envisioned the school site of this research as having pasture fields and row crops on the plots adjacent to the school. Perhaps there are stands of long straight thin loblolly pine trees directly across the road, as characterize so many out-of-town places in eastern North Carolina. And so, in my mind at least, the school looks like a rural school. But the rhetorical question (and answer) I posed in the original chapter was this:

Did these discourse issues arise from the physically rural location of the school and its contrasts to the "in town" and "in the neighborhood" experience of the students? Quite likely the reader will be forced to answer both yes and no. But the discourse issue was not really a rural school issue per se as much as an indication of a difficult mixing of socioeconomic class, racial and ethnic groups (p. 355).

The school problems identified by rural education research has not typically been characterized by these kinds of issues.

When I was writing the chapter on rural science education I made several references to the "myth of rural education." And each time, my editor would ask "what is the myth to which you refer?" I wanted to answer, "You know, the rural myth. The myth of how life was safe, peaceful, and good in rural places of the past." But it was only after the chapter had been finalized that I found the article for which the myth was explained in the terms I had meant. In the chapter, I had cited Sher (1983) who wrote that rural schools have less specialization among the teachers, less equipment both in and out of classroom, and less bureaucracy. He had also reported that rural schools have a greater tendency toward teaching the aspects of basic education, more recognition of the individual contributions, and more relaxed relationships between faculty, administration and staff. But these are not the aspects of the rural school which address the myth to which I was referring.

Rather the myth to which I referred was the one described by Keppel in her article from 1962 titled *The Myth of Agrarianism in Rural Education Reform, 1890-1914*. I will quote a long passage from Keppel to illustrate.

From Thomas Jefferson and John Taylor of Caroline on through the nineteenth century, the image of the virtuous yeoman as the very backbone of the nation on whose well-being the security of the entire nation rested, was an ubiquitous theme in literature by no means restricted to those writing on agriculture or on education appropriate to farm children. The agrarian tradition, of ancient lineage, was appropriate to an America in which not only the bulk of its people but its intellectual and political leaders directly experienced life on the farm or traced their immediate forbears to cultivators of the soil. The American version of the Arcadian myth possessed peculiarly staying qualities, particularly when threatened, when the facts of American life which had sustained it for so many generations were in the process of drastic alteration and it was problematic that we would indefinitely continue to be an agricultural people (p. 103).

And the myth of rural education continues to shape the theoretical frameworks that we bring to bear on our research in rural schools. For instance, in a Northwest Regional Ed Lab

publication titled *Riding the Wind: Rural leadership in science and mathematics education*, the authors write: "Rural teachers throughout the country find that leading by example is an invaluable tool in their efforts to help students reach their limits. Like the rugged terrain in his home school district, Tate's tough job assignment prods him to strive harder rather than give up. This is a common response to the dilemmas of rural teaching conditions. The challenges stimulate teachers to make admirable progress toward education reform instead of stopping them in their tracks (Batey & Hart-Landsberg, 1993, p. 6)." And, as such, the teacher of the rural school becomes a parallel to the yeoman farmer of the agrarian myth.

In the future, rural schools will become increasingly difficult to characterize due to the influence of the waves of culture-delivering technology emanating from some center of our society. While interpersonal isolation may persist, the availability of connections to the larger network of our culture will be increasingly difficult to avoid. The day will come in the very near future, perhaps fewer than 10 years from now, when a device like our current cell phone will not only have the power to connect each of us to everyone other person, it will also connect us to all knowledge in our society and culture. And in that day of the near future, we will be hard pressed to describe a rural school by its isolation and thus we may have no way of knowing whether it is outside the sphere of influence of urban America unless we visit and interview the people found there. Our framework for describing a rural school may not allow for any generalization, but we can hope that the myth still lives in the people we find there.

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