

Alternative Modes of Inquiry for Agricultural Education

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The Journal of the American Association of Teacher Educators in Agriculture (AATEA) represents the broad research interests of the Agricultural Education profession. As such, it should be representative of the research conducted in the profession. Utilizing classifications interpreted by Borg and Gall (1983) and Kaplan (1963), a review of the articles published in the Journal during 1986 and 1987 revealed that 84% of the articles could be classified as quantitative (they were based upon numerical data), while only some 13% were qualitative (findings were based upon subjective observations). The remaining articles were not research articles but were special articles of interest to the profession.

The Problem

While some might argue with the designation, inquiry in education is based largely upon social sciences (Borg & Gall, 1983, p. 29). It seems appropriate that this field should limit its procedures for inquiry almost exclusively to a single mode of inquiry. The purpose of this paper is, to present three currently recognized modes of inquiry available for research in agricultural education, including those which are alternatives to quantitative approaches.

Procedures

Each of three modes of inquiry will be presented and discussed as a procedure for research in agricultural education. Specific procedures for the conduct of each will not be included. This discussion is drawn, in part, from articles by Smith, Jax, and Coomer in the Fall 1984 issue of the Journal of Vocational Education Research.

Alternative Modes of Inquiry

Popular conception would classify research approaches as either quantitative or qualitative. However, there are currently three modes of inquiry in scientific research identified in the literature which are applicable to problems in agricultural education. They are the positivistic mode, the interpretive mode, and the critical science mode. The positivistic mode is at times called quantitative or empirical-analytic while the interpretive and critical modes are often classified as qualitative procedures. The most dominant in agricultural education research is the positivistic paradigm. The other two are recognized, accepted and utilized to a much less degree among researchers in agricultural education.

Positivism is based upon the theory that basic laws exist which govern all phenomena. Factors within these phenomena can be separated and quantified for statistical analyses; and the researcher is value-free in the research.

Very broadly, interpretivism and critical science are each based upon assumptions that factors within social phenomena are inseparable and, indeed, defined by the interactions of the phenomena and the individuals involved, rather than by natural law. Rather than quantification, each of these modes of inquiry is rooted in phenomenology. Analyses are based upon ethnographic procedures in which the researcher seeks to become a part of the social system or culture under study to determine the meanings behind social interactions.

Positivism

Positivism draws its theories from the so-called hard sciences in which, it is believed, some basic laws exist. It searches for the ultimate truths of these laws by building theory through generalizations which are the result of experimental or mathematical controls. These theories provide for at least five implicit assumptions which underlie positivistic research within social sciences (Pophewitz, 1980):

1. Theory is universal and sets of principles and rules of inference can be deductively arrived at to describe the interaction of social/behavioral phenomenon.
2. A commitment to a universal principle of disinterested, value-free objectivity is important. The values and goals of the investigator are independent of statements of science.
3. Social/behavioral sciences exist as a system of variables and factors which are distinct and analytically separable and can be studied independently of each other.

4. There is a need to formalize knowledge using theories and variables which are operationally distinct from each other and defined accordingly.
5. Hypotheses about principles of theories are tested by the quantification of observations and by the use of mathematical/statistical models.

These assumptions require as requisite conditions: a deductive logic based upon some theory, rule or principle; the identification and operational definition of relatively independent sets of variables; quantification of variables, objective, value free perception of the variables and the theories; and tests of hypotheses using various mathematical/statistical methods. The model as applied to research in agricultural education is one of a deductive, reflective thinking process, consisting of what Dewey (1933) referred to as the process of reflective thinking. The ultimate goal of reflective thinking is to evolve some stable principle, generalization, or theory to serve as the basis for testing the validity of a proposed theory or generalization in an internally consistent manner (Smith, 1984).

Several strategies can be used to design positivistic studies. While authors may disagree with specifics of design and methodologies, these strategies are, for the most part, on a continuum ranging from subjective to objective (historical, descriptive, case study, relational, quasi-experimental, experimental). The test always seems to be whether the intent of the researcher is to assess the relationship among sets of analytically independent variables and to test for specific a priori hypothesized relationships among these variables (Smith, 1984).

Interpretive Research

Interpretive research is an alternative method of coming to understand new knowledge for agricultural education. While positivism seeks to generalize and build theories about phenomena through control, interpretivism seeks to understand the values, beliefs and meanings of phenomena.

Van Mannen (1975) suggested that the purpose of interpretive science is to systematically search for understanding of the ways people subjectively experience their world. Interpretive scientists study actions or responses to experience conditioned by the culture and the related conceptual schemes of those being studied (Bredo and Feinberg, 1982). This research attempts to clarify, authenticate and uncover meaning embedded in the forces of cultural process. Jax (1984) suggested that research questions arise for interpretive scientists when there is a need for an experimentally meaningful, historically original, or authentically human understanding of some aspect of the interactive cultural system.

Assumptions underlying interpretive science include (Jax, 1984):

1. Human beings are self-interpreting beings capable of interpreting other people's language as well as their own actions and language.
2. The person acting or speaking brings to any situation a framework of personal meaning.
3. As an actor or a speaker in a social cultural scene, experience is not a private but an intersubjective occurrence.
4. The meaning of an act or the symbolic use of language cannot be separated from the context of the situation.
5. Human beings cannot be reduced to parts; their completeness is more than the sum of their parts.
6. Actions and language are rule governed. Rules have been defined by social practices and institutions, and they have value attached to them.
7. Human beings reason affectively as well as cognitively.
8. The self as a thinker is linked to the self as an actor and speaker.

The theoretical foundation of an interpretive scientist's approach is referred to as phenomenological theory and is based upon work by Husserl (1952), Schutz (1962, 1964), and Weber (1964). In this approach the researcher takes on the role of the person or group being studied and attempts to understand the context of the situation within the framework of the participants. Phenomenology is not the study of the objectives themselves, but rather their conceptualizations (Schutz, 1962), and through the consideration of the conceptualizations held by the subjects a more holistic comprehension of the human phenomena is provided.

Jax contends that interpretive science seeks to make visible certain aspects of social reality through dialogue and to generate typifying examples of social phenomena and events (1981). An understanding of how those being studied interpret and give meaning to their situations is sought.

Arriving at questions within specific social contexts, rather than broad generalizations, is the intent of interpretive scientists. Validity is a function of researcher and subject being able to construct and share common meanings. Just as statistics are the tools of the positivist, phenomenology and ethnography are the tools of the interpretivist. Ethnography is rooted in anthropology and involves the search for meaning created and represented in cultural symbols by decoding and uncovering these symbols. Malinowski (1922) stated that the goal of ethnography is to grasp the "native's point of view, his relation to life, to realize his vision of this world." Pelto and Pelto (1978) suggested that this is done by engaging in field work wherein one concentrates on the study of cultural patterns by living with or near the people being studied. Thus the process of acquiring data is inductive.

Critical Science

Critical science research is based upon a framework described as critical social theory. Critical theory can be traced to the Frankfurt School in Germany (Shroyer, 1973) and the more recent works of Habermas (1971, 1973, 1975, 1979). An analysis of Habermas' contributions to critical theory is included in Bernstein (1976).

Positivists believe that as researchers they assume a value-free objectivity in their inquiry. Positivists seek knowledge of previously unknown truths, with little regard as to how that knowledge will be used. Critical scientists seek an understanding of our society and its institutions, through which the individual can and will decide to act upon injustices in order to change them. Positivism requires a view of reality which includes a system of distinct and analytically separable factors which can be studied independently. Critical science believes that social systems are intricate inseparable systems of individual and group views which constitute concepts of reality.

The critical scientist is therefore concerned with determining the way people think about social affairs so that they can become self-conscious about the reasons behind their relationships and actions. Critical theory, according to Habermas (1973), allows people to understand the values and actions in social affairs, and to change the world to minimize human suffering and maximize human development and responsibility. By comparison, interpretive scientists seek only to describe the world, stopping short of effecting social reconstruction.

Critical theory focuses upon the process of people achieving a self-knowledge so that they can make decisions about courses of action. This is accomplished by identifying the discrepancies between the ideal state and the existing state. Through the use of knowledge, the critical scientist attempts to move the existing state toward the goal state. Assumptions which underlie critical science as a mode of inquiry include:

1. Social and natural science phenomena are not the same in that social science research cannot be normatively neutral.
2. Value questions should be based upon reason.
3. There has been an overemphasis on technical rationality in our society.
4. There is a reciprocal relationship between the individual, the institutions in society, and the culture which they have created.
5. Society can best be changed by systematically sought self-reflection.
6. People have the potential to become self-reflective and can affect the formative processes of themselves and society.
7. People need to become self-conscious about what they believe and value as well as why they act as they do if they are to become active in rationale choices about their future actions.
8. There is a need for a view of research which would provide a framework to critique the social order as historically developing and interacting human structures. (Haberman, from Coomer, 1984).

Critical science research can provide an awareness of values and beliefs as a part of inquiry. This awareness empowers people with knowledge which can lead to substantive change in the social system being researched. It can provide a way of thinking critically about the world, including the interconnected networks which provide meanings to the concepts and values held.

Summary and Conclusions

An example of positivistic research as applied to education would be describing the relationships between students' academic performance, in quantifiable terms, and various teaching methodology.

Given a similar situation, the interpretive researcher would seek to determine the effects that each differing teaching methodology had on the students and the teachers in terms of their preferences, needs, values and attitudes. The interpretive researcher might ultimately seek to understand how the cultural and social background of each student and teacher would interact with each teaching methodology. The critical scientist would use the findings of the interpretive research to seek to produce related social change. For example, if the researcher found that the students' preferences for a particular teaching methodology could produce the long term change of increasing the satisfaction of the students in their learning, with the ultimate effect of their completing school, the researcher would seek to empower those responsible for implementation of the educational program with this knowledge so that teaching method might be used.

The differences are then: positivists seek to describe "what is" in terms of isolated and quantifiable factors; interpretivists seek to describe "what is" in terms of the human values and meanings placed upon phenomena which may interact with each other; critical scientists seek to describe "what is" in terms of the values and understandings behind social phenomena and they then seek to pursue their conceptions of "what ought to be" based upon these understandings, ultimately empowering others with this knowledge.

Webster's dictionary (1972) defines research as, "studious inquiry or examination; investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in light of new facts, or practical application of such new or revised theories or laws" (underline added). Perhaps positivists' ideal of value free objectivity prohibits their application of research findings; if they were to make application of findings they would cease to become researchers at that point and take on a new role. In fact, Ary, Jacobs and Razavieh (1979) define research as, "...the application of scientific approach to the study of a problem. Its' purpose is to discover answers to meaningful questions through the application of scientific procedures." They continue, "...research is universally a systematic and objective search for reliable knowledge." This obviously falls short of any explicit goal of effecting change within the purview of research. Borg and Gall (1983) make a distinction between applied and basic research but do not suggest that effecting change is within the research paradigm. They state, "...the primary purpose of applied research is to test the effectiveness of different...methods of programs and to gather data that will be of use in...decision making." And that in education, "...the purpose of basic research is to gain an understanding of underlying processes involved in learning, schooling, and other educational phenomena." Each of the conceptions of research described above are rooted in the concept of research as positivism.

Implications

If the types of articles found in the professional journal of Agricultural Education are an indicator of the conceptions of research held by agricultural education researchers, then those researchers believe that their function is the search for knowledge, as the vast majority of those articles are positivistic. As described earlier, positivistic researchers seek knowledge to inform practice, but because a basic assumption of positivism is that the researcher is value-free, the researcher cannot implement change and remain in the role of researcher. One wonders what agricultural education researchers would identify as their goal if they were surveyed. It is presumed that many would describe what they do as a search for knowledge to inform practice and bring about change. This seems in contrast to the types of research being reported. An example is this article. If this researcher presents this information in a positivistic mode, then the goal is the expansion of knowledge in agricultural education research. If the goal of this article is to effect change, then this researcher has gone beyond the role of researcher in a positivistic sense to become a critical scientist.

Much of the research conducted by agricultural education researchers is descriptive in nature. These researchers seek to describe and explain in terms of quantitative measures. However, social science research does not always lend itself to quantitative description. There are phenomena for which a deeper understanding of personal attitudes and values is required; these are best described in alternative modes of inquiry. The case could easily be made that some research problems may best be answered by a combination of modes of inquiry, wherein one in a sense validates the other. A study of the induction of beginning teachers into the teaching profession seems an ideal example of researchable problem which is too complicated for a positivistic approach alone. Indeed, the complexity of the teaching situation itself may be best studied through a combination of approaches for each common phenomenon.

Space limitations in this article preclude the inclusion of a discussion of specific procedures for planning, conducting and reporting research in each mode of inquiry. It is hoped that this article

will serve to increase awareness of alternative modes of agricultural education research, and that future articles might address specific procedures.

Each of the three paradigms discussed herein is a mode of inquiry for conducting research in agricultural education. The positivistic mode has traditionally been most often used by agriculture education researchers and it most conveniently incorporates the assumptions associated with quantification. The interpretive mode seems to offer much to researchers in agricultural education who seek to answer many questions which may not lend themselves to quantification. Both the positivistic and interpretive paradigms fit best into the conceptions of research which are presumably held by many researchers, and the interpretive mode may be the easiest to add to their repertoire of research skills. However, the critical science paradigm goes beyond the goals of the search for knowledge to add attention to normative questions and especially supports the goal of applying knowledge through reasoned action to effect social change. For this paradigm to become widely accepted, attitudes held by researchers about the purposes of research will have to be expanded. One wonders if the Agricultural Education is ready to meet that challenge.

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