Strengthening Agricultural Research Capacity for Viable Extension Policies in Nigeria: An Exploration of Ricoeur's Hermeneutic Theory for Analysing Extension Research

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Abstract

Progressively more, researchers use hermeneutic philosophy to inform the conduct of interpretive research. Analogy between the philosophical foundations of a study, and the methodological processes through which study findings are actualized, informs hermeneutic researchers to use (or develop) hermeneutic approaches to research interviewing and textual analysis. Paul Ricoeur's theory of interpretation provides one approach through which researchers using hermeneutics can achieve congruence between philosophy, methodology and method. Ricoeur's theory of interpretation acknowledges the interrelationship between epistemology (interpretation) and ontology (interpreter). Also, Ricoeur notes the way interpretation moves forward from raw understanding, where the interpreter has a superficial grasp of the whole of the text, to deeper understanding, where the interpreter understands the parts of the text in relation to the whole and the whole of the text in relation to its parts (the hermeneutic circle). In this way, Ricoeur's theory of interpretation provides researchers with a method of developing inter-subjective knowledge which could aid policy advocacy, design and implementation for the professionalization of extension in Nigeria. Through exposition of the concepts of Ricoeur's theory, which include distanciation, appropriation, explanation and understanding, guess, and validation, a hermeneutic approach to textual analysis is presented, discussed and critiqued as a way of strengthening Nigeria's extension research capacity and relevance. Examples from Tundun-Iya Adopted Village research on farmers' adoption of GPS for farm measurement are used to demonstrate points under discussion. It is suggested that, in conjunction with Gadamer's hermeneutic of understanding, Ricoeur's theory of interpretation warrants consideration as a method of textual analysis by extension experts in Nigeria.

Key words: Ricoeur Hermeneutics, textual analysis, extension.

Introduction

There is increasing interest in hermeneutics as a research approach in the field of health, information, education and intelligent systems as well as in agricultural research. However, the problem facing researchers is that there is a paucity of information on the application of hermeneutics for empirical research in the social sciences; indeed, there is very little guidance on what exactly constitutes a hermeneutic method for the

investigation of social phenomena especially in agriculture. In order to address this problem, this paper provides an overview of concepts and principles from the related philosophies of phenomenology and hermeneutics; it then illustrates their application in an interpretive case study of the select community and NAERLS on agricultural extension practices and adoption.

The insights obtained from the application of the hermeneutic method outlined in this paper have helped realize the study's objective of illustrating the link between phenomenological hermeneutics and the conduct of interpretive research. The heart of this article will feature the concepts of knowing and understanding; highlighted in the discussion will be to know more through research. Ray (1987) wrote that research is not a process of proving something but a process of discovering and learning; we may see problem solving, thinking, learning, research and discovery as one and the same process because each leads to more knowledge. Krathwohl (1985) noted that research will not always result in the ultimate goal of to know with certainty but as progressing down the road to knowing. That is, research moves toward the solutions to problems, but does not always solve the problem. Roling (1974) wrote that social science research is not geared to make conclusion (generalizations) but as decisions, a formula for action. Warmbrod (1993a) called for researchers to understand and know. Therefore, research is more a process of evolution than revolution and seeks to understand as well as know.

Hermeneutics focuses primarily on the *meaning* of qualitative data, especially textual data. The purpose of using hermeneutics is to aid human understanding. It helps the qualitative researcher understand what people say and do, and why. Hermeneutics is primarily concerned with understanding and interpreting the *meaning* of a text or text-analogue. 'Interpretation' in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or a text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory - in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense (Taylor 1976: 153). A 'text-analogue' is anything that can be treated as a text, such as an organization or a culture. The hermeneutic task consists in understanding what a particular text means. Hermeneutics helps a researcher to produce a story that is believable. Historicity, hermeneutic circle, prejudice, autonomization, distanciation, appropriation and engagement are concepts in hermeneutic that work together for a better interpretation of an event. Historicity refers to the thesis that (who we *are* through historical). Who we are is a function of the historical circumstances and community that we find ourselves in, the language we speak; the historically evolving habits and practice we appropriate and the temporally conditioned choices we make. Hermeneutics defends the ontological claim that human beings *are* their history (Wachterhauser, 1986: 7). The hermeneutic circle refers to the dialectic between the understanding of the text as a whole and the interpretation of its parts, in which descriptions are guided by anticipated explanations (Gadamer, 1976a: 117).The hermeneutic circle suggests that we understand a complex whole from preconceptions about the meanings of its parts. Human understanding is achieved by iterating between the parts and the whole which they form. Hermeneutic phenomenology is not a method of research but, rather, both a theoretical perspective

and a methodology, a strategy or plan that lies behind the methods employed in a particular study (Crotty, 1998).

Unless there is clarity and accountability of method, it is difficult to assign the degree of rigor to [agricultural extension] work that is demanded in an era which has been dominated by the view that scientific knowledge is utterly objective and is the only type of evidence that is valid and certain (Crotty,1998). It has been argued that qualitative methodological theory might be both unnecessary and counterproductive (Avis, 2003). Avis has argued that often such methodologies are used to justify particular methods in a manner that closes off any scrutiny or reflective examination of those methods. However, as rightly noted by some researchers, we work in a context system in which policymakers and funding bodies predominantly cling to the view that the only truth is so-called objective truth.

It therefore remains important that the methods employed in qualitative studies are accountable and rigorous, if their results are to be seen as making a genuine contribution to knowledge. The work of Gadamer (1989) and especially Ricoeur (1981) further developed Heidegger's (1967) ideas in the areas of method and interpretation of hermeneutic phenomenological research in a direction that has helped to address this difficulty. The goal of interpretation is 'to produce a reading of the text that fits all important details into a consistent, coherent message, one that fits coherently into the context . . .' (Diesing, 1991: 110). Hermeneutics suggests that 'prejudice', pre-judgement or prior knowledge plays an important part in our understanding of social phenomenon. Our attempt to understand a text always involves some prior knowledge or expectation of what the text is about. In fact, we cannot understand a text unless we have some understanding of the language. Hermeneutics suggests that understanding always involves interpretation; interpretation means using one's own preconceptions so that the meaning of the object can become clear to us (Gadamer, 1975: 358). The critical task of hermeneutics then becomes one of distinguishing between 'true prejudices, by which we understand, from the false ones by which we misunderstand' (Gadamer, 1976b: 124).

As researchers, we need to become aware of how our own views, biases, culture and personal history have a significant impact on how we view the world. Ricoeur (1981) makes an important distinction between verbal speech and written text. Ricoeur says that the author's meaning, once it is inscribed in a text, takes on a life of its own. This process of autonomization takes place whenever speech is inscribed in a text. This means that the text now has an autonomous, 'objective' existence independent of the author. Once something is published or in the public domain, it is virtually impossible to take it back. Ricoeur (1981) makes an important distinction between verbal speech and written text. He says that the author's meaning, once it is inscribed in a text, takes on a life of its own. This process of autonomization takes place whenever speech is inscribed in a text. Ricoeur suggests that the hermeneutic task is to make Aristotle's writings our own. In this instance, make extension research by others our own. The 'text is the medium through which we understand ourselves' (Ricoeur, 1991: 87). Gadamer suggests that meaning does not reside in 'the subjective feelings of the interpreter' nor in 'the intentions of the author'. Rather, meaning emerges from the engagement of reader and text. This process of critical engagement with the text is crucial.

Purpose of the Study

Discipline-specific, basic agricultural research programs are needed and will continue. This article is not an attack upon the research in the agricultural disciplines. However, agricultural educators must think beyond discipline-specific research, and relate to subject matter research or problem solving research (Johnson, 1986). Some government officials and parastatals usually undervalue subject matter and problem solving research as compared to discipline specific research. Research in agricultural extension will not necessarily emanate from biotechnology, big-science, or macroeconomics but from the concerns of extension services about people, and could perhaps be termed as being conducted for "social good." Many departments are now comprised several disciplines: agricultural education, extension, leadership and/or communication. For the sake of brevity, the term "Agricultural Extension" will be used to represent all of these disciplines. Many agricultural researchers and research administrators do not clearly understand or acknowledge the knowledge base of these disciplines. Agricultural extension research tends to be toward the "soft" on a "soft hard" continuum, and toward the "applied" on an "applied-basic" continuum.

Warmbrod (1993b), quoting from Buriak and Shinn (1989), stated that research station directors often perceived that: Agricultural extension research is "soft", it does not have clearly defined objectives or hypothesis, lacks focus and rigor, is not programmatic, and is not sufficiently funded. It is conducted by persons with weak training in research methodology who: (1) Cannot identify important research problems (2) do not value research endeavours (3) conduct research for promotion and tenure rather than for its importance and utility and (4) have a limited amount of time assigned for research. Given this low opinion of agricultural extension research by government ministries, one would hardly be surprised if other agricultural colleagues (those with international organizations) would have similar views.

These colleagues have a conception of what constitutes good research, and agricultural extension research does not fit their concept. Their definition of research is based on their education and experience and they believe a good research is synonymous with experiments; and, as in positivistic research, all research must be driven by hypotheses. Other agricultural researchers perceive that they "know" research! After all, they have been doing research throughout their professional careers, they learned from their mentors, and they are well published, discipline-specific researchers – they know how to do experimental research. The problem with agricultural extension research is not always poor quality; the problem may be the lens through which other researchers view the standards for quality research. Their lens is "positivistic", and has a discipline-specific focus. Consider this problem from the perspective of "knowing" and the philosophy of science. Habermas (1972) proposed that what drives research is the specific interest a researcher has in the knowledge and that those interests take several forms. Oliga (1988) summarized the basic elements of Habermas' Interest Constitution Theory (Table 1) and noted that the three different knowledge types implied different methodological approaches - namely, empirical, hermeneutic and critical methodologies. Table 1 can help one understand the position of agricultural extension relative to other agricultural disciplines populated by "empiricists" or "positivistic" researchers. The experimental researcher wants to produce

"laws", the interpretive researcher wants to reach "consensus and meaning," and the critical scientist wants to achieve emancipation" through reasoned choice.

Table.1 Habermas' Interest Constitution Theory Diagrammed

Knowledge (interest)	Basis of human interest	Type of interaction	Underlying paradigm	Method of Approach
Technical (control)	Labour	Man -- Nature	Functionalist (Experimental)	Empiricism (Positivism)
Practical (understanding)	Communicative interaction	Man -- Man	Interpretative	Hermeneutics
Emancipatory (freedom)	Authority (power)	Man – Self	Radical/Critical	Critique

Adapted from Miller (2006). *A philosophical framework for agricultural education research*. Ohio: Ohio State University.

Van Manen (1977) noted that each of the three forms of inquiry is distinctive in terms of (a) its way of looking at people and society, (b) the form of knowledge it produces, (c) its logic in use, (d) its methodologies and techniques, and (e) the use to which the knowledge can be put. Wardlow (1989) and Copa (1984) stated that most of agricultural education research has been positivistic, but many of our problems are too complex for just one mode of inquiry. At other times, researchers may wish to explain and predict phenomena. Researchers also wish to control – to do experimental research – but that is not the only way of knowing as some would propose. When dealing with people, control of the independent variable, manipulation (random assignment of experimental units – people - to levels of the independent variable) is usually not feasible and often unethical. One purpose (or type) of research does not produce knowledge that is more important than another purpose of research. The accumulation of knowledge in a discipline necessitates that all types of research be conducted. Experiments and *ex post facto* studies are driven by hypothesis. Correlational and survey researches are directed by research questions or objectives. Thus, hypotheses are not sacrosanct to all research! This is one of the philosophies underpinning this paper as an advocacy for the utilization of hermeneutic interpretation of research in extension.

Methodology

This adoption study was conducted in Tudun-Iya of Katsina State, Nigeria between 7th and 18th of January 2013. Tudun-Iya is located in the southern part of Funtua Local Government Area of Katsina State. Prior to introduction of GPS for farm measurement in Tudun-Iya, farmers in the community either left their farms unmeasured or used conventional method of measuring farms. However, the conventional method is not only time-consuming but costly and energy-sapping. Hence, the need to introduce the use of GPS was underscored. Within a short period after the introduction of the GPS

technology, an unprecedented adoption rate (97.7%) by the community was recorded. This has saved the farmers' time, money and energy spent on farm measurement. Land ownership remains a status symbol in Nigeria especially in the rural areas. However, the degree of accuracy of the measure of land has remained a problem in the Nigeria agriculture. This has attendant consequence in estimating the quantity of input needed as well as yield computation. One hundred (100) farms that scattered within and outside Tudun-Iya were eventually measured during the exercise. Also, 102 hectares of lands were measured. The least size of the farm measured was 0.07 hectare while the maximum was 4.75 hectares. More than half (53%) of the lands used for farming operation within the community were inherited. only 36% of the farms were located within Tudun-Iya while the remaining (64%) were outside Tudun-iya. The GPS tool has been widely adopted in Tudun-Iya. Post-study revealed that the adoption of GPS innovation has spill-over effects as other farmers outside the study group have used the GPS to measure their farms representing 250% of the initial targeted farmers. According to NAERLS (2011), the community has an estimated population of about thirty seven thousand three hundred with 46% male and 54% female. The community is blessed with a highway that linked the State with Kaduna State in the South and Zamfara State in the North. It consists of sixteen villages headed by village head (Mai Unguwa). All the villages are linked with the community by feeder roads. The major language in the community is Hausa. About 98% of the community speaks Hausa while the remaining 2% speaks Fulfulde.

The community is an agrarian settlement with maize, guinea corn, soya beans, sugarcane and cotton as the major cultivated crops in the area. The community also has streams which are used by the inhabitant for irrigation farming. Number of farmers in the community was estimated at 16,785 cutting across gender while the average number of children per farm family is 8. The vegetation type in the area is guinea savannah.

Hydrological sources include rivers, boreholes and wells. The community has its land on a flat land area while a few of the land located on hilly areas and Fadama areas. The community mostly experience dry spell at the beginning of the rainy season and flood around August-September. Other disasters include pest infestation like army worm and Downey Mildew. Major soil conservation and management practice in the village include manuring, crop rotation, mulching, planting of cover crops, fallow and constructions of contour bounds to check erosion by running water. The major livestock found in the community include sheep and goats, poultry, donkeys, cattle. Feed for livestock are sourced from the markets and household and farms. Types of feeds of livestock in the village include crop residues, maize and guinea corn bran; hulms of groundnut, cowpea and soya beans, grasses. Provision of health care for livestock is majorly by farmers, veterinary attendants in the village and veterinary doctors in the area. Livestock are marketed in the nearby markets, neighbours etc. The average income from agriculture among the community members ranges between N50, 000 to N500, 000 per annum (Survey, 2013).

Because this is a position paper that relies on content analysis with structured interview to elicit data, the theoretical framework undergirding this position is the Critical Discourse Analysis (CDA). The theory is used as a combined analytical instrument with the hermeneutic theory for this study. Like other critical theories, CDAs, are afforded

special standing as guides for human action. They are aimed at producing both enlightenment and emancipation. These types of theories do not only seek to describe and explain, but also to root out a particular kind of delusion. Even with differing concepts of ideology, critical theory seeks to create awareness in agents of their own needs and interests. This was, of course, also taken up by Pierre Bourdieu's concepts of "violence symbolique" (Bourdieu 1989). One of the aims of CDA is to "demystify" discourses by deciphering ideologies. For CDA, language is not powerful on its own – it gains power by the use powerful people make of it. This explains why CDA often chooses the perspective of those who suffer, and critically analyzes the language use of those in power, who are responsible for the existence of inequalities and who also have the means and the opportunity to improve conditions. In agreement with its Critical Theory predecessors, CDA emphasizes the need for interdisciplinary work in order to gain a proper understanding of how language functions in constituting and transmitting knowledge, in organizing social institutions or in exercising power.

An important perspective in CDA related to the notion of "power" is that it is very rare that a text is the work of any one person. In texts, discursive differences are negotiated; they are governed by differences in power which is in part encoded in and determined by discourse and by genre.

Therefore, texts are often sites of struggle in that they show traces of differing discourses and ideologies, all contending and struggling for dominance. Thus, the defining features of CDA are to be seen in their concern with power as a central condition in social life, and in their efforts to develop a theory of language which incorporates this as a major premise. Not only the notion of struggles for power and control, but also the inter-textuality and recon-textualization of competing discourses in various public spaces and genres are closely attended to by CDA. The differences between *scientific theories* and *critical theories* lie along three dimensions, following the Frankfurt School (Anthonissen, 2001): First, they differ in their aim or goal, and therefore also in the way they are used. Scientific theories aim at successful manipulation of the external world: they have 'instrumental use'.

Critical theories aim at making 'agents' aware of hidden coercion, thereby, freeing them from that social coercion and putting them in a position where they can determine their true interests.

Second, critical and scientific theories differ in their 'cognitive' structure. Scientific theories are 'objectifying' in that one can distinguish between the theory and the objects to which the theory refers. The theory is not part of the object-domain which it describes. A critical theory, on the other hand, is 'reflective' in that it is always itself a part of the object-domain it describes. Such theories are in part about themselves. Third, critical and scientific theories differ in the kind of evidence which would determine whether or not they are acceptable. Thus, these theories require different kinds of confirmation.

Results/Discussions

In the level 1 analysis, the internal nature of the text (interview transcripts, as well as the researcher's journal notes on observations and experiences of the farmers meetings and interviews, which could not have been apparent in the interview transcripts), as discussed above, was examined. The transcripts and notes were analyzed, each one

being individually coded to node (unorganized or emergent ideas). This involved coding any word, phrase, sentence, or group of sentences that said anything at all about the farmer's or farmers' group experience of being trained on how to use GPS, the farm measurement, or the interview. Any information about the individual's or community history, culture, ways of relating or past experiences with extension workers that might have any relevance to their experiences in being involved in this study were also coded to free nodes. More than 250 nodes were created. A few examples of these are *"brought us closer," "benefitted from it," "calmed down," "a bit worry,"* and *"nervous".* At this level, words were taken at face meaning, and no attempt was made to interpret. Unless identical words were used to express an idea, a new node was created. This is a relatively mechanical process and does not involve interpretation or decisions about whether two different sets of words have the same meaning. Before we proceeded to level 2 of the analysis, the documents were re-read to ensure that no ideas had been missed or inaccurately assumed to be identical to another.

In the level 2 analysis the first stage of involved examining the nodes that had been coded in level 1 analysis and coming to an understanding about which ones referred to the same or closely connected ideas. Those with common meanings were grouped into four main themes. Each theme was given a description identifying the main idea of the data coded to it (as it was perceived at that point). For example, the nodes that talked about the individual's experience of the training and its outcomes were collected under the theme *Personal Experience and Outcomes* (which was described as anything that talked about how the respondents experienced the training and any outcomes it had had or was expected to have for them). The other themes identified are related to the respondents' observations of the experience of other individuals and NAERLS extension work as a whole i.e. the respondents' observations about the general applicability of the training within the extension service and issues of individual and community history, culture and personalities that might have influenced their experience of the training. Attention was then focused on the collection of ideas within each theme. In each case a number of subthemes were identified.

For example, the subtheme entitled *Outcomes for the Respondents* was described as including "anything" that gives information about the outcomes of the training for the respondents – things that have continued on from the training or anything that is new for them since the training that they connect to their experience of the training. Each subtheme was then examined individually to identify how the nodes coded to it could be grouped into categories, with each category speaking of some aspect of the subtheme.

Each category was also given a description. For example, one category informing the subtheme entitled. The speaker's experience of the training was called *how they felt* and included all nodes of information about (how the speaker felt during the training or as a direct result of it). Data coded to subthemes about the community farming culture, history, relationships, and communication habits was used in the preparation of community profiles. To this point of the analysis it can be argued that the process is virtually identical to the technique of thematic analysis (Luborsky, 1994). The naive level of understanding achieved in level 2 analysis is still to a large extent based on the internal nature of the text but does include making decisions about the similar or near identical meaning of particular words and phrases. At this point interpretation begins, and the process is to some degree influenced both by the readers' understanding of the

meaning of particular words and by their experience of the individuals involved. The latter would include their impressions of these participants in the training, the interviews, and things that they said about themselves and their background in both settings. It is in level 3 of the analysis that the process takes on a more unique and accountable quality. In the level 3 analysis where in depth interrogation is done, the process of arriving at an in-depth understanding involves moving back and forth between explanation and understanding (the hermeneutic circle).

The acts of interpretation that are a part of this process are informed by areas of knowledge. First, there is the experience and beliefs that the researcher brings to the task (pre-understanding), which were documented. The second type of contributing knowledge is the researchers' knowledge and experience of the individuals and community taking part in the study, as expressed in the community profiles compiled as indicated in the previous description of Tundun-Iya. This interpretation of factors that are external to the text restores it to a living communication. Level 3 analysis can be demonstrated clearly in the management of apparent contradictions or ambiguities in the data presented by the farmers' group head. Parts of the interviews with members of the farmers' group are also considered along with the interviewer's notes on the training. E.g.: *"I didn't see it [the training] as being anything that was going to make farming change for the better or anything like that. I did not think that farmers in this community would enjoy any benefit from this measurement thing. But what was really interesting was that (another farmer) who was previously outside of this community and is with us opened up, particularly because he has seen this technology used in Abuja, and I was very, very pleased that he assured us that the training was going to help us greatly. He was here yesterday and whenever he comes in to the training, as soon as we see him we are confident to stay and listen to what the trainers (extension workers) have to tell us".* Furthermore, his greetings: *"hello fellow farmers, how are we today?"* and so on just kept on stimulating the farmers interests and they continued to love that from somebody who is more educated and has travelled to the city; and now sitting with the farmers and doing farming is very encouraging to everyone of the group.

In summary, these passages seem to be saying the following: There will be no changes in the farming methods as a result of the training. He has not changed his mind about outcomes from the training but acknowledges that there were some surprises in a farmer's behaviour during the training. He describes a big change in the believe of the farmers since the training, which he thinks "is just wonderful" and influenced by the presence and account of experience by a farmer who has witnessed the use of GPS for farm measurements in Abuja. The following steps were taken in investigating this apparent contradiction:

I. The researcher listened again to this section of the recorded interview. It was noted that the speaker was somewhat clinical in his initial summation but became more animated and enthusiastic in his expression in the third excerpt quoted above.

II. Evidence relating to the speakers' situation, personality, and ideas about extension services, was reviewed. The following were key factors: "thinks the local farmers need no farm measurements"; "farmers know their farm boundaries – that's expected"; "definitely we share farming experiences in the group"; " other farmers know what I feel, about this training and GPS thing, I don't need to say it" ; "a little bit technical, this

training" ; "only once seen him get angry with extension workers" ; "likes to work in group and not leave things undone on farm" ; "strict with farming rules" .

III. Any comments made in interviews by other members of the farmers group about the response of (other group members whose farm practices had changed) due to the training were reviewed and the following evidence noted: "the community head is now part of the farmers group"; "He felt a bit apart before"; "he was not a member of the farmers group at the initial stage compared to the rest". Comments made by the farmers' group head were closely examined. His experience is summed up by the following key points: "I know where I stand now with the farmers," "I was struggling with it for some time," "I never really felt I am part of the farmers," "I've been able to relax a little bit more among them now," "it's a lot better," and "it's fantastic". Comments such as those quoted above stimulated the primary researcher to review own experience and beliefs, and to consider if they were influencing the interpretation of this apparent contradiction.

She was aware of the following in this regard: Her community background was strict on head of community participating in farmers' training in agriculture especially at the research institute premises which usually lacks the minimal forum to express personal feelings and verbalize intimate thoughts openly. Having grown away from that point of view significantly, and learned that others do not usually know what you think and feel if you do not tell them, the researcher was cautious of responding negatively to some of the views expressed by the community head. Consequently, all the relevant information was reviewed to come to a conclusion about what the farmers' head really meant. It was concluded that there were significant changes in his relationship with the farmers group as a result of the training. This is supported not only by his later statement but by the views of other members of the group. It was also considered that the reason for farmers' head change of view might have been influenced by a number of factors. Perhaps, he initially felt a bit apprehensive about the unfamiliar process, being a person who likes to be in control of farmers matters and is used to a dominant role in relation to females (the interviewer was female). To admit the training had brought change in the way the farmers measure their farm land might be to admit that his community was not current and lack modern knowledge of farming.

As the interview (after the training) proceeded, however, the he realized the interviewer was not threatening or had hiding agenda, and he relaxed and was able to acknowledge and express his delight about the change in the farmers by coming out to admit the training would help them to be more productive in their farming in the next farming season. The account provided above of how the interpreter progressed from naive to in depth understanding of the farmers' experience, demonstrates how a process of moving back and forward between explanation and understanding eventually achieves in-depth understanding. This account also incidentally demonstrates how the farmers appropriated their experience of the training, enabling them to appreciate a new way of measurement for farming activities.

However, this in-depth understanding can be taken seriously as evidence only if it can be demonstrated that the process conforms to accepted standards of rigor. Issues of rigor in the use of Ricoeur's theory of interpretation will now be discussed. Rice and Ezzy (1999) have described five main areas of consideration to ensure the rigor of qualitative studies. These are theoretical (having a theoretical underpinning and

methods which are consistent with this), procedural, interpretive, evaluative, and reflexive rigor. Procedural rigor is achieved through the careful documentation of how all decisions are reached (Rice and Ezzy, 1999). In the reported study, this was achieved by the establishment of an audit trail that included all processes conducted during the research. Although in no way can Ricoeur's theory be pressed into an accountability regime, the three levels of analysis that arise from his theory provide an identifiable process that can be documented and repeated by others. It needs to be kept in mind, however, that others repeating the process will not necessarily arrive at the exact same interpretations, something which is certainly consistent with Ricoeur's ideas about distanciation on four levels discussed above. This is, of course, a relevant issue in relation to interpretive rigor.

An account has interpretive rigor if it accurately represents the understandings of events and actions within the framework and worldview of the people engaged in them (Rice and Ezzy, 1999, p.36). The significant question is, "on what grounds can a particular interpretation be considered accurate"? As explained, proponents of Ricoeur's theory of interpretation would accept that because of the interaction between the world of the text and the world of the interpreter, each interpreter's account of the same text is likely to be at least slightly different from others and, in fact, an account made by the same interpreter at a later date might differ from the first one as that interpreter's world might have changed in the interim. However, adherence to the process of three levels of analysis, as outlined by Ricoeur, which includes conscious awareness of and consideration of the experience and worldviews of all participants, including the researcher, the use of direct quotes and the documentation of all analysis decisions (procedural rigor), supports our aim to faithfully represent a text by providing every opportunity for its truths to be revealed.

Rigorous qualitative research that takes into account the role of the researcher in the research process (Rice and Ezzy, 1999) involves honest reflexivity. This needs to include an awareness and openness on the part of the researcher about how his or her background, beliefs, life experience, and political views affect their involvement in the research. Integral to Ricoeur's (1981) theory of interpretation is the acknowledgment that the researcher is a part of the environment of the study and that his or her impact needs to be constantly assessed and taken into account along with the other data. This is part of the process of Ricoeur's hermeneutic arc in which an interpretation arises out of the moving back and forth between the parts (including the impact of the researcher) and the whole. The use of this theory as a tool for data analysis, therefore, enhances the likelihood of achieving rigorous reflexivity.

Conclusion
In this article we have summarized the development of hermeneutic phenomenology, including Ricoeur's theory of interpretation. The three levels of interpretation that arise from this theory have been outlined, and their application to a study informed by hermeneutic phenomenology has been demonstrated. The degree to which this process of interpretation conforms to accepted standards of rigor in qualitative studies has also been considered. The firm foundation on which Ricoeur's theory of interpretation has been developed, includes congruence with the work of both Heidegger and Gadamer. It

is a very useful model for the analysis and interpretation of text in a manner that enables rigorous outcomes in agricultural extension research.

We recommend Ricoeur's theory of interpretation as a tool for the interpretation of data collected in studies whose philosophical underpinning understanding human dynamics as they affect the environment. It deserves consideration by agricultural extension researchers who seek to provide a rigorous foundation for their work in interpreting the social world of human beings and agricultural activities.

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