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Naturalistic inquiry in e-learning research

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Abstract

In this article, the author explains how and why one particular qualitative research approach, the naturalistic inquiry paradigm, was implemented in an e-learning research study that investigated the use of the World Wide Web technology in higher education. A framework is presented that situates the research study within the qualitative research literature. The author then justifies how the study was compliant with naturalistic inquiry and concludes by presenting a model for judging the quality of such research. The purpose of this article is to provide an example of how naturalistic inquiry can be implemented in e-learning research that can serve as a guide for researchers undertaking this form of qualitative inquiry. As such, the focus of the article is to illustrate how methodological issues pertaining to naturalistic inquiry were addressed and justified to represent a rigorous research approach rather than presenting the results of the research study.

Keywords: computers in education, qualitative research, Internet, quality, electronic learning

Introduction

Qualitative research means many things to many people. This complex and evolving field of inquiry embraces a wide array of approaches, methods, and techniques, and is accompanied by ongoing debate over what constitutes quality and rigor. It is complex, because it embraces multiple perspectives from the human disciplines, and as Denzin and Lincoln (2000) concluded, “An embarrassment of choices now characterizes the field of qualitative research. There have never been so many paradigms, strategies of inquiry, or methods of analysis for researchers to draw upon and utilize” (p. 18). It is an evolving field of inquiry due to its relatively short history in comparison to conventional scientific research (Erlandson, Harris, Skipper, & Allen, 1993). Paradoxically, the field of qualitative research will remain to evolve by the very nature of its underpinning philosophy from which its definition is derived. Denzin and Lincoln categorized the current phase of the historical evolution of qualitative research as “a moment of discovery and

rediscovery, as new ways of looking, interpreting, arguing, and writing are debated and discussed" (p. 18).

Although some researchers have explicitly attempted to define and categorize various approaches of qualitative research (one example being Creswell, 1998), the literature is replete with confounding use of jargon. (This, in turn, contributes to its complexity, especially for the neophyte researcher.) For example, the term qualitative research is used predominantly as an umbrella term to depict research conducted in a natural setting to investigate a social or human issue in contrast to the opponent positivist approach (Creswell, 1998, 2003; Denzin & Lincoln, 2000; Lancy, 1993; Neuman, 2004). However, it has also been used synonymously with case study (see Merriam, 1988, p. xii), ethnography (see Goetz & LeCompte, 1984, p. 3), grounded theory (see Neuman, 2004, p. 87), phenomenology (see Lancy, 1993, p. 9), and naturalistic inquiry (see Lincoln & Guba, 1985). Yet, these particular qualitative approaches are also open to interpretation. For example, consider the case study method of inquiry. Stake (2000) indicated that although the case study has become a common way to do qualitative inquiry, it might not be "essentially qualitative" (p. 435). Lancy (1993) claimed, "case study does not adhere to the qualitative paradigm" (p. 142), a statement with which Yin (1993) concurred. Lincoln and Guba (1985) have viewed case study not as a method of inquiry but as a form of writing or presentation for reporting the results of a naturalistic inquiry.

Given such nuances in definition, researchers require guidance on how to implement qualitative research in a rigorous manner. O'Donoghue and Punch (2003) contended that although a wide range of methodological literature exists, there is a paucity of works that demonstrate how qualitative research methodology can be practically applied by researchers. In this article, I aim to address this gap by demonstrating how a particular qualitative research approach, that is, the naturalistic inquiry paradigm (Lincoln & Guba, 1985), was implemented in an e-learning research study. First, I present a description of the study, followed by a discussion about how I made meaning of the qualitative research literature to apply it. I then illustrate how the study complied with the naturalistic inquiry approach and conclude by presenting a model to justify how the study constitutes "quality" research. My purpose in this article is to provide an example of how qualitative research has been applied, which could serve as checklist or as a guide to assist researchers when implementing naturalistic inquiry. As such, my focus in this article is to illustrate how methodological issues pertaining to naturalistic inquiry were addressed and justified to represent a rigorous research approach, rather than presenting the results of the research study.

Research study context

I conducted a research study examining the interactions established among students and an instructor in an e-learning course delivered using World Wide Web and videoconferencing technologies (Agostinho, 2000; Corrent-Agostinho, Hedberg, & Lefoe, 1998; Hedberg & Corrent-Agostinho, 2000). The purpose of the study was to inform the evolution of pedagogical strategies for Web-based learning environments. At the time of the study (late 1990s to 2000), this targeted a gap in the educational technology research literature; that is, although the introduction of the World Wide Web was being embraced as a revolutionary technology for education (Owston, 1997), the rhetoric about its potential for educational use surpassed the analytic research being conducted that explored the pedagogical strategies in which such a technology can be implemented—particularly within the higher education context (Beattie & James, 1997; Collis, 1998). There was a need for research about interactive online learning environments focused on improving pedagogical practice rather than constrained to proving hypotheses (Reeves, 1999). There were also calls for qualitative research to inform pedagogical

innovation, as such research focuses on the detail of what occurs in a Web-based learning environment (Windschitl, 1998). "Because technology, when used to its best advantage, helps reshape roles for teachers and learners and encourages new and different types of interactions in the classroom, qualitative approaches should be considered to investigate these phenomena" (p. 31). Thus, a qualitative research study into the use of the Web within a university postgraduate environment was instigated. The postgraduate context was of particular significance, as although the use of flexible delivery modes in Australian postgraduate education was on the rise, their specific influence on postgraduate education had had little investigation (Beattie & James, 1997).

The method of inquiry for the study was a collective case study (Stake, 1997) comprising two cases, which were two implementation cycles of the same postgraduate course (offered by the Graduate School of Education at the University of Wollongong). Both cases involved two geographically separated groups of students and involved the implementation of Internet technology to facilitate interaction between the two groups. The insights gained from the first case were used to redesign the teaching and learning environment for the second case. Three research questions guided the investigation:

- What kind of interaction can be established in a technology-supported learning community?
- What is possible in the technology-supported learning environment that is not possible without the use of technology? and
- What are the perceptions of the instructor and the learners in terms of the learning outcomes generated?

I sought approval for the research by submitting appropriate documentation to the University of Wollongong Human Research Ethics Committee. A letter of consent was distributed to all students in both cases. I ensured participants of anonymity and explained to them that withdrawal as participants was possible at any time. All participants signed the letter, and the consent forms were archived.

In the first case, the introduction of Internet and videoconferencing technologies enabled students to experience the use of technology while learning about its use in an educational context. The course itself was structured as a pilot study by the university's educational development unit to test flexible delivery technologies. An educational consultant from this unit provided instructional and technical support to the instructor. To facilitate this trial, there were two geographically separate classes. Eight students met on campus, and six students met off campus (in Sydney, 80 km north of Wollongong). Both classes were held on the same evening for 3 hours over a semester of 14 weeks. Videoconferencing and a course Web site facilitated interaction between the two geographically separate classes. The instructor physically attended each separate class on alternate weeks. The researcher (author) physically attended every on-campus class. The use of a course Web site and videoconferencing was a new experience for most of the students. Thus, one reason why the instructor selected this course as a pilot study was to allow students to experience firsthand the process of implementation and evaluation of technology-based learning.

In the second case, the course was implemented using Internet technology. There were two geographically separate classes. Eleven students met on campus, and six students met off campus. The two classes were held on different evenings for 3 hours. During the 14-week semester, students attended eight class meetings and participated in asynchronous and synchronous online discussions during the non-meeting weeks. A Web site facilitated interaction among the students and instructor outside class time. The instructor physically attended every face-to-face meeting. The researcher attended the face-to-face classes held on campus.

Given that this study focused on an issue that had had little investigation and further understanding was sought, a qualitative research design in the form of case study research was deemed appropriate. The purpose was to provide a detailed description of the interactions established in the technology-mediated learning environment—"thick description" (Lincoln & Guba, 1985)—and report the lessons learned. Participant observation enabled me to interact with the students as a peer. I exhibited a nonthreatening, nonauthoritarian presence. This facilitated the building of rapport and trust with the student participants.

In the first case, the researcher entered the setting with no previous experience with the use of videoconferencing, creating Web pages, and using Web-based computer-mediated communication (CMC) tools. The researcher observed how the students and the instructor interacted via the technology-based media and also experienced the use of the technology as she interacted with fellow students and the instructor using the technology. The student participants were aware of the research study, and because the course content was of a similar focus to the research, I was able to discuss observations with them. My objective during this case was to observe phenomena and not deliberately influence the process of events.

I entered the second case with insight gained from the first case. I interacted with the student participants as a peer yet also assumed the informal role of assistant instructor. This role was of an informal nature, because much of the instructor assistance occurred "behind the scenes," that is, outside class time (for example, modifying and updating the course Web site).

Framework to situate the study within the qualitative research literature

To situate the research method of this study within the qualitative research literature, I devised a framework. The framework, based on the work of Creswell (1998), Denzin and Lincoln (2000), and Lancy (1993), explicitly outlines that the definition of qualitative research is dependent on the viewpoint from which it is discussed: that is the philosophical viewpoint, the strategy or method of inquiry used, or the tactics employed to collect and analyze data. Lancy provided particular insight to the formulation of this framework by explaining that when discussing qualitative research, one needs to establish at what level the discussion is occurring:

Before one discusses what is or is not qualitative research one must first establish whether the discussion is occurring at the level of paradigm, method, or technique. To sum up: When one follows the qualitative paradigm, one buys into an entire philosophy of inquiry . . . that stands in sharp contrast to the tenets underlying quantitative research; one may follow a particular qualitative research method (e.g., case study) that deviates somewhat from the purest form of the paradigm and; one can work entirely within the quantitative paradigm and yet, occasionally, use a qualitative technique such as conducting open-ended interviews as a preliminary step in the design of a standardized survey instrument. (p. 8)

The framework is presented in Table 1 and illustrates the philosophical viewpoint, the strategy/method of inquiry, and the tactics for collecting and analyzing data employed in this research study. Such a model could be used as a guide for researchers when developing a research study proposal.

To summarize, the tenets of the naturalistic inquiry paradigm (Lincoln & Guba, 1985)—more recently coined constructivist inquiry (Lincoln & Guba, 2000), were adhered to in this study. The method of inquiry employed was a collective case study, because the focus of the study was to provide an in-depth analysis of the two cases and the outcome was to report the lessons learned

(Creswell, 1998) from the two cases. The term collective case study (Stake, 1997) was adopted, because the two deliveries of the postgraduate course are two cases that are systemically related, as the findings from the first case were used as input for the second case. The predominant data collection technique used was participant observation. Interviews and questionnaires were conducted; documents and artifacts were collected. Data analysis, which was conducted during and after data collection, involved the identification of dominant themes and the clustering of themes into categories (Merriam, 1988). Content analysis, based on the framework presented by Henri (1992), was an additional technique used to deconstruct what occurred in the online environment when synchronous and asynchronous discussions were held during both implementations of the course.

Table 1:Framework to situate this research study within the qualitative research literature

Perspective of the process of inquiry	*Rationale and illustrative quotes*	*This research study*
Paradigm **Underlying philosophy**	"Qualitative researchers approach their studies with a certain paradigm or worldview, a basic set of beliefs or assumptions that guide their inquiries. These assumptions are related to the nature of reality (the ontology issue), the relationship of the researcher to that being researched (the epistemological issue), the role of values in a study (the axiological issue), and the process of research (the methodological issue)" (Creswell, 1998, p. 74).	Naturalistic inquiry (Lincoln & Guba, 1985), more recently coined constructivist inquiry (Lincoln & Guba, 2000)
Strategy, method, or tradition of inquiry **The strategy**	"A strategy of inquiry comprises a bundle of skills, assumptions, and practices that the researcher employs as he or she moves from paradigm to the empirical world. Strategies of inquiry put paradigms of interpretation into motion" (Denzin & Lincoln, 2000, p. 22).	Case study (collective)
Data collection and analysis techniques **The tactic(s)**	"Strategies of inquiry also connect the researcher to specific methods of collecting and analysing empirical materials" (Denzin & Lincoln, 2000, p. 22).	Data collection techniques: participant observation, interview, questionnaire, reflexive journal Data analysis techniques: data abstraction into themes and categories (Merriam, 1988), content analysis (Henri, 1992)

Rationale for adopting the naturalistic inquiry paradigm

Conventional forms of inquiry are couched within the positivist paradigm, whereby the concept of reality is viewed as existing "out there," is ever unchanging and external to the inquirer—coined as naïve realism (Lincoln & Guba, 2000). Such a perspective assumes that all people experience the world in the same way, and thus, the goal of conducting social science research is to learn more about how the world works so that phenomena can be controlled or predicted.

Opponents to positivism view reality not as an entity separate and external from the individual but as internally constructed. People perceive the world differently; therefore, reality is relative to

each of us. Consequently, multiple constructions of reality exist, and these constructions can change over time as people engage socially in their world and become better informed. Thus, the purpose of social science research is to understand and reconstruct the constructions people initially hold to form a consensus. However, the findings from such research are open to further interpretation as information and sophistication improves.

It is the latter ontological assumption that underlies the naturalistic inquiry paradigm. Lincoln and Guba (1985) concluded, "For virtually all instances of sociobehavioral inquiry, the naturalistic paradigm is the paradigm of choice" (p. 260). They elaborated by stating that the naturalistic inquiry paradigm is the paradigm of choice when

- the paradigm fits with the focus of the inquiry and
- the substantive theory (if selected) fits with the inquiry paradigm.

Table 2: Naturalistic inquiry paradigm—The three requirements

Requirement	*Illustrative quote*	*Demonstration of compliance in this study*
The inquiry process is consistent with the ontological, epistemo- logical, and axiological assump- tions of the five proposed axioms	"The inquirer [is to] adopt the stance suggested by the axioms of the naturalistic paradigm. These axioms form a synergistic set, and must be adopted as a set. Mix-and-match strategies are not allowed, nor are accommodations or compromises" (p. 251)[a]	Detailed in Table 3
The inquirer is committed to the development of skills to operate as an effective instrument	"The inquirer commit . . . Herself to the development of a level of skill appropriate to a human instrument and sufficiently high to ward off criticism on the grounds of instrumental inadequacy" (p. 252)	I produced an electronic research audit trail for the study
The inquirer has developed an initial design statement	"We shall presume that . . . The inquirer has made a serious effort to develop an initial design statement" (p. 250)	A research proposal was presented and approved

NOTE: All quotes are from Lincoln and Guba (1985).

I contend that the focus and context of this study, which was the examination of student and instructor interaction in a Web-based postgraduate course, and the constructivist teaching approach adopted by the instructor in the course, is well suited to naturalistic inquiry. Thus, the issue under investigation, the context of the course, the educational theory that underpins the delivery of the course, and the research paradigm, are congruent, achieving a state of value resonance (Lincoln & Guba, 1985).

How the study was compliant to the naturalistic inquiry paradigm

To claim that the study adhered to the naturalistic inquiry paradigm assumes the three mandatory requirements for labeling a study naturalistic were fulfilled (Lincoln & Guba, 1985). In Table 2, I have outlined the three requirements and have illustrated how these requirements were implemented in the study. This table could be used as a checklist or template by researchers employing naturalistic inquiry to ensure compliance with the paradigm's requirements.

Judging the "quality" of the research study

Because of the complex and evolving nature of qualitative research, the criteria for judging the quality, or goodness, of a qualitative inquiry are not well resolved (Creswell, 1998) and are a topic of continuing debate (Lincoln & Guba, 2000). From the researcher's immersion in the qualitative research literature, assessing the quality of a qualitative research study seems dependent on three factors:

- the design of the research: that is, the appropriateness of the research design for the research problem;
- the process in which the inquiry is undertaken: that is, demonstrating rigor and how well the research process can facilitate "truthful" and accurate findings; and
- the outcome of the research: that is, the usefulness of the research project to the community.

These three factors serve as criteria to discuss how this study represented quality research. This is explained as follows.

Table 3: Naturalistic inquiry paradigm—The five axioms

Axiom	*Illustrative quote*	*Characteristics of this research study that demonstrate compliance to the five axioms*
The nature of reality: Realities are multiple, constructed, and holistic	"Naturalistic ontology suggests that realities are whole that cannot be understood in isolation from their contexts" (p. 39)[a]	· The postgraduate course provided a natural context-rich setting; it was not created for research purposes · Both cases were examined from a holistic perspective as the researcher participated as a student and later as a teacher-participant for the duration of each course implementation · Several forms of data were collected to capture various participant perspectives · Participant comments during the course and feedback after completion of the course were used to illustrate the findings that emerged from the two cases · The collective case study method of inquiry permitted a more informed understanding to emerge about the type of interaction that can be established with the use of network technology in postgraduate education; prediction and control were not intended outcomes of this study · The criteria used to discuss the rigor of this study are based on a naturalistic ontology
The relationship of knower to the known: Knower and known are interactive and inseparable	"The inquirer and the 'object' of inquiry interact to influence one another; knower and known are inseparable" (p. 37).	· The researcher assumed the role of a participant observer and interacted with the participants as a student in each course implementation · The researcher discussed emergent issues and themes with the participants in both cases; the participants also shared their opinions and views about the course with the researcher; thus,

		the researcher's "voice" was that of a "passionate participant" not a "disinterested scientist" (p. 166)
The possibility of generalization: Only working hypotheses are possible	"The aim of inquiry is to develop an idiographic body of knowledge in the form of 'working hypotheses' that describe the individual case" (p. 38).	· The researcher published findings during the study; these published papers presented working hypotheses · The lessons learned from Case 1 and Case 2 were the working hypotheses developed from this study; the working hypotheses formed in Case 1 were implemented in Case 2, and this second case facilitated their refinement
The possibility of causal linkages: It is impossible to distinguish causes from effects	"All entities are in a state of mutual simultaneous shaping so that it is impossible to distinguish causes from effects" (p. 38).	The research design of this study, that is Case 1 informed the implementation of Case 2, is itself a demonstration of compliance to this axiom; the following quote by Lincoln and Guba (1985) illustrates this point: "Interventions can be mounted, but without any assurance, regardless of prior evaluation, that they will in fact produce the outcomes hoped for. Indeed, all one can do is introduce yet another 'shaper'—the intervention—into the mix; how this intervention will shape other elements in the situation, or how the intervention will itself be shaped by those elements, is a matter that can be settled only with experience over time" (p. 157).
The role of values: Inquiry is value bound	"Inquiry is . . . Influenced by the values of the inquirer…the assumptions underlying both the substantive theory and the methodological paradigm . . . And by the values that characterize the context in which the inquiry is carried out" (p. 161).	This study represents a value-resonant (p. 38) inquiry, as the focus and context of the study, and the constructivist teaching approach exhibit congruence

NOTE: It is difficult to isolate characteristics of this study specifically to each axiom as there is overlap, that is, interdependence. However, it is provided in this format simply as an overview.

a. All quotes are from Lincoln and Guba (1985).

Quality criterion 1: Appropriateness of the research design

Lincoln & Guba (1985) stated that there needs to be a match (congruence) between the problem being investigated, the inquiry paradigm, and the context in which the research is conducted for the inquiry to be able to produce meaningful results. As I explained earlier, I contend that the research design was appropriate for this study because the issue under investigation, the context of the course, the educational theory that underpinned the delivery of the course, and the research paradigm exhibited congruence.

Quality criterion 2: Demonstration of rigor

Benchmarks of rigor for conventional scientific inquiry, that is, internal and external validity, reliability, and objectivity, are based on the ontological belief of scientific realism. Such assessment criteria are not, however, commensurable with the naturalistic inquiry paradigm (Lincoln & Guba, 1985). There are multiple perspectives in the qualitative research literature

about rigor (Creswell, 1998). Some authors discuss the issue of rigor using the conventional terms but apply different definitions to these terms (e.g., see Creswell, 1998, p. 200; Merriam, 1988, p. 163-184; Neuman, 2004, p. 283-285). Other authors have adopted alternative labels (see Creswell, 1998, p. 200, for a summary).

Because I adoped in this study a qualitative research approach from the paradigm perspective and have adhered to the naturalistic inquiry paradigm, it was appropriate that rigor be discussed according to the naturalistic process quality criteria of trustworthiness and authenticity. Creswell (1998) has provided eight verification procedures and recommended that a qualitative researcher engage in at least two of them in a research study. His suggested procedures encompass the trustworthiness criteria presented by Lincoln and Guba (1985). The discussion below highlights that this study went well beyond the minimum requirements suggested by Creswell (1998), as seven of his eight verification procedures were operationalized.

How trustworthiness was established

Trustworthiness was established based on the framework presented by Lincoln and Guba (1985). The trustworthiness criteria of credibility, transferability, dependability, and confirmability were achieved by implementation of the following nine techniques: prolonged engagement, persistent observation, triangulation, peer debriefing, negative case analysis, member checks, providing thick description, compiling an audit trail, and producing a reflexive journal. A description of how each technique was implemented in this study is provided below. (Apart from implementing the procedure of "Referential Adequacy" and conducting a dependability and confirmability audit, all techniques proposed by Lincoln and Guba [1985] have been applied.)

Prolonged engagement. Prolonged engagement was demonstrated as follows:

- the researcher was involved as a participant observer for the entire duration of the course in both cases, and
- two cycles of the same course were examined which facilitated the production of a more sophisticated reconstruction than if only one cycle of the course was examined.

Persistent observation. Persistent observation was demonstrated through the diligent recording of the face-to-face classes, the videoconferencing sessions, and the online interaction for the duration of both courses.

Triangulation. Triangulation was exhibited during the data collection and data analysis phases of this study. During data collection, different types of data were collected, such as researcher observations (which were time stamped to correlate with the online discussion transcripts), online discussion transcripts, videoconferencing recorded sessions, recorded audio of face-to-face classes, interviews with participants, and student-produced artifacts. During data analysis, different types of data were used to refine and substantiate emergent themes. For example, online discussion transcripts were triangulated with the field notes. Different data analysis techniques were performed during the study that led to a high degree of convergence. For example, a "skimming the cream" analysis approach (Smith, 1978) and member checks performed during data collection were triangulated with the more rigorous analysis conducted after the completion of data collection (that is, the completion of the two courses).

Peer debriefing. Peer debriefing occurred informally during this study through discussions with educational technology research colleagues from the Faculty of Education. One colleague, in particular, became the researcher's peer debriefer for most of the study's duration. She provided

support, namely in the form of empathy, as she understood the emotional frustration that qualitative research can afford. (Documentation of all peer debriefing meetings held is provided in Agostinho, 2000).

Negative case analysis. Negative case analysis was applied during data analysis to refine the clustering of themes into categories. (This is explained and justified in Agostinho, 2000. The data analysis discussion has not been included in this article because of space restrictions.)

Member checks. Member checking was conducted both informally—during the data collection phase of this study—and formally—after data collection was completed.

- *Informal member checks*: For the first case, findings and working hypotheses were synthesised into a publication format, enabling informal member checks. For the second case, a paper about the findings and working hypotheses was presented at a virtual conference. All students were informed about the paper, and feedback was requested. Feedback was received from one student from the on-campus class. After all data collection was completed, informal member checking was performed with the instructor in the form of collaboration in writing publications about the findings from this study.
- *Formal member checks*: When the case study draft reports were completed, a comprehensive member check was conducted with several students and the instructor.

Thick description. Thick description of the two cases is presented in the doctoral thesis (Agostinho, 2000).

Accessibility to an audit trail. According to Lincoln and Guba (1985), a research audit trail comprises six categories of information:

1. *raw data*, for example, written field notes and audio- and videorecordings;

2. *data reduction and analysis products*, for example, summaries, theme identification, and working hypotheses;

3. *data reconstruction and synthesis products*, for example, clustering of themes into categories, interpretations, and final report;

4. *process notes*, for example, methodological notes and trustworthiness notes;

5. *information about intentions and disposition*, for example, the research proposal and personal notes; and

6. *instrument development information*, for example, questionnaire design and semistructured interview questions.

An audit trail, which included these six categories, was compiled in electronic form and stored on CD-ROM.

Reflexive journal. I maintained a reflexive journal for the entire study. It was initially intended as a central repository for ideas, thoughts, and literature references. However, it became the backbone of recording the entire study. It also served as an outlet for emotions, and as a product, it represented a detailed chronological historical account of the entire study and thesis production and publication processes.

I contend that the criteria for establishing trustworthiness in this study were appropriately met. To conclude this discussion about trustworthiness, it is important, however, to note its open-ended nature:

> Naturalistic criteria of trustworthiness are open-ended; they can never be satisfied to such an extent that the trustworthiness of the inquiry could be labeled as unassailable . . . naturalistic inquiry operates as an open system; no amount of member checking, triangulation, persistent observation, auditing, or whatever can ever compel; it can at best persuade. (Lincoln & Guba, 1985, p. 329, emphasis in original)

How I facilitated authenticity

Erlandson et al. (1993) have provided the following argument for authenticity:

> Trustworthiness is not sufficient as a measure of quality in a naturalistic study . . . naturalistic inquiry takes its strength from the separate realities that have been constructed by different individuals. These separate realities must be given status in the lives of those individuals, in the contexts in which they operate, and in reports of inquiry. . . . The award of such status is recognized as "authenticity." It is the duty of the naturalistic researcher to enable it. (p. 151)

I contend that I enabled authenticity throughout the study, as during both cases, I discussed the research topic and emergent themes with the students. At the commencement of both cases, I introduced myself and explained the nature of the research to the students. As the course progressed (in each case), I interacted with the students and maintained a dialogue with them about their ideas and perceptions about the course and about the issues that surfaced for me.

Quality criterion 3: Usefulness of the research product

The findings from a qualitative research study should be communicated in such a way that they can be understood by others. As Shulman (1997) has stated,

> Research begins in wonder and curiosity but ends in teaching. The work of the researcher must always lead to a process in which we teach what we have learned to our peers in the education community. Our work is neither meaningful not consequential until is it understood by others. (p. 6)

Furthermore, the research product, particularly in educational research, should further human understanding, "so that the quality of educational practice can be improved" (Barone & Eisner, 1997, p. 85).

The research premise for this study was to further understanding, that is, to inform pedagogical innovation about the development of Web-based learning environments. As such, conclusions were reported in the form of guidelines to assist practitioners when developing Web-based learning environments. In addition, research outcomes were communicated throughout the period of the study in refereed journal articles and conference proceedings (two examples include Corrent-Agostinho et al., 1998; and Hedberg, & Corrent-Agostinho, 2000).

In summary, I contend that this study represented "quality" research for three reasons. First, the research design was congruent with the research focus, enabling flexibility and permitting the issues to unfold in a naturalistic setting. Second, rigor was achieved through the establishment of

trustworthiness and authenticity. The trustworthiness criteria of credibility, transferability, dependability, and confirmability were operationalized by the following nine activities: prolonged engagement, persistent observation, triangulation, peer debriefing, negative case analysis, member checks, providing thick descriptions of the two cases, compiling an electronic audit trail (stored on CD-ROM to facilitate retrieval of data), and the maintenance of a reflexive journal for the duration of the study. Authenticity was demonstrated through the open dialogue that occurred between the researcher and the students. Third, the need for this study, highlighted in this article but discussed in length in Agostinho (2000), justifies that this research represented a useful contribution to the e-learning literature.

Conclusion

In this article, I have presented from a practical perspective how and why I implemented the naturalistic inquiry paradigm in an e-learning research study that examined the interactions established in a Web-based learning course for the purpose of improving pedagogical practice. First, I presented a framework to situate the research study within the qualitative research literature, which was followed by a justification of the study's compliance with naturalistic inquiry. Finally, I presented criteria to justify how the study constitutes quality research. This article serves to demonstrate how this type of research method was applied and how it can be justified to represent rigorous and quality research. It could thus be used as a checklist for researchers embarking on this type of research. The framework presented could also be used as a guide when conceptualizing the initial design of a research study.

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