Introduction

As I mentioned in chapter 1, this study was guided by a number of interrelated research questions.   The main research questions addressed the dynamics that arose in the groups as a result of the introduction of the *Survivor©* game elements.   The research questions are:

1.   What are the implications of playing games with adult learners in an online learning community?
2.   How did the web-based module on elearning, that was inspired by the ideas from the reality television show *Survivor©*, affect the interactions of, and the dynamics between adult learners?

To make the answers to these questions more explicit, the researcher formulated the following four sub-questions:

- How could a web-based module on elearning be designed so that it would closely resemble the game structure of the *Survivor©* reality show? (This question is addressed in chapter 4.)
- How did this module develop over time, and what were the key issues that emerged?   (This question is addressed in chapter 5.)

- How did the reality game elements affect the various types of interaction and the group's functioning as a whole?   (This question is addressed in chapter 6.)
- What are the complexities involved in teaching and learning by means of a module that is based on a metaphor such as *Survivor©*?   (This question is addressed in chapter 7.)

This study aims to address the main questions by dealing with these four sub-questions.

The purpose of this chapter is to present and discuss the research design employed in addressing these questions. An outline and justification of the research methods utilised in designing, presenting and researching the *CyberSurfiver* module is provided in the remainder of the chapter.

The *CyberSurfiver* module was presented as one of a number of modules that make up the Master's Degree in Education (Computer Integrated Education) as the University of Pretoria presents it. Prof Johannes Cronjé, the programme coordinator and also one of my research supervisors, initiated the *Survivor©* concept, and conducted a number of brainstorming sessions with me because I have functioned as the designer and facilitator of the research. During these sessions, we grounded the design of the

module in existing principles as they are set out in the literature on constructivism, games and play theories, adult learning theories, motivation theories, group formation principles, and theories about the various types of interaction that are possible in an online educational environment.

The *CyberSurfiver* module was a design experiment (I use this term synonymously with 'design research') that provided me with the opportunity to investigate the complexities involved in using a metaphor in an adult online learning environment. The module was designed according to the constructivist learning theories in which active learner participation is an important component of the learning process, and in which learners construct their own knowledge while they engage in authentic learning activities (Gagnon & Collay n.d.; Fosnot 1996). By planning and developing the module as a design experiment, I was able to test and refine its educational design. While my main emphasis was on the refinement of practice in the design, I also addressed a number of theoretical issues (Van den Akker 1999).
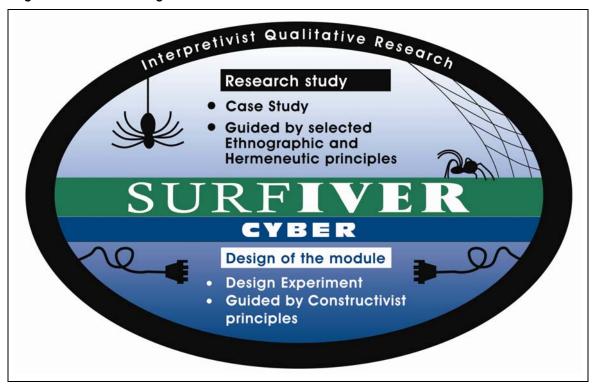
The amount of research that could still be undertaken by using *CyberSurfiver* as a design experiment is enormous. By this I mean that the *CyberSurfiver* module could still be studied exclusively as a design

experiment because it lends itself to this kind of investigation. In this study, I chose to limit the scope of my research to the interactions among members of the online community that already existed because of the decision to use a game metaphor to teach the module. Even though the main focus of this study is therefore not on the *design* of the module, the design is nevertheless crucial to an understanding of the dynamics that arose during the module. I therefore devote this chapter to its examination.

This chapter will deal with the design experiment and the ADDIE Instructional Design model related to the design of the *CyberSurfiver* module. It will also describe the research approach that I adopted in order to study the various types of interaction that took place in the online module. In addition, I shall give special attention to (1) Interpretivism because it dictates the goal of my inquiry, (2) the case study because it determined what *could* be studied, (3) the research method, and (4) the selective influence of ethnography and hermeneutics as they affect this research.

Figure 3 reminds the reader of the research design as it was explained in chapter 1.

Figure 3: Research Design

Paradigm for the study

Fierce debates have raged in the past among the proponents of qualitative and quantitative research (Weinstein & Tamur 1978; Berg 1989; Campbell 1975). I personally regard both qualitative and quantitative methods as valid within the boundaries of their well-understood limitations. I regard both of them as alternatives that may sometimes complement each other. They are not, as far as I am concerned, in competition. For this study I have adopted a mainly qualitative interpretivist approach because my intention has been to provide evidence that is richly textured and layered in its detail for the thesis that I have proposed in connection with this teaching module.

Any attempted definition of qualitative research would of necessity ultimately prove to be elusive, possibly vague, deliberately imprecise and certainly open-ended. The term *qualitative* encapsulates so many research methods that a single definition is almost impossible. Creswell (1998) attempted one when he wrote:

> Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a

complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting.

The *CyberSurfiver* study was also guided by Creswell's (1998) five assumptions about qualitative research. They are:

- the multiple nature of reality
- the close relationship of the researcher to that which is being researched
- the value-laden aspect of inquiry
- the personal approach to writing the narrative
- the emerging inductive methodology of the process of research

The *CyberSurfiver* case study clearly presented examples of the multiple nature of reality. Whereas some learners experienced the activities as stimulating and challenging, others found themselves lost and in despair.

My role was not only that of researcher. I was also the designer and the facilitator of the learning experience under scrutiny. As such, I formed close relationships with many of the learners in the six-week period during which the module lasted. I thus also found that tensions arose because the points of view that I had to adopt as I fulfilled my various roles and as I processed interpretation of the

realities of the situation were not always readily compatible.

In this case, there were good reasons why I should choose a qualitative approach. Some of the most compelling reasons for undertaking this study in a qualitative manner arose out of the nature of the research questions. These questions focussed on 'what' and 'how' questions – rather than on 'why' things happened in the way they did. Firstly, the study concerned itself with the dynamics that evolved throughout the duration of the online course and on how aspects of the game contributed to this phenomenon. Secondly, the topic needed to be explored in depth because not all the variables could easily be identified. There were also far too many variables to locate and control in a study of a purely quantitative nature.

An advantage that this case study offered me was that it gave me the opportunity to study a number of extremely interesting social interactions at a relatively low price. The overhead costs in this case were low because only a small number of learners were needed to perform the required observations and interpretation of data. The cost of much research is high because the researcher usually requires the services of a number of assistants or collaborators to conduct random-sample surveys and population censuses.

Thirdly, the research called for a detailed and in-depth interpretation of the case. As a single case study was the focus of the research, the depth of the investigation was of utmost importance. Fourthly, the study was conducted by using a large variety of data sources that were obtained from the learners in their natural setting as students. Fifthly, my intention was to include *myself* and my role as designer and facilitator of the course as an integral part of the study. As Byrne (2001) writes: 'Qualitative research assumes that the researcher is an integral part of the research process.'

In qualitative research, learner's descriptions and stories are often scored according to a protocol of carefully designed techniques. This is done so that the susceptibility of qualitative techniques to skewing as a result of researcher or evaluator bias may be minimised. Instead of using those techniques, I used the qualitative technique of hermeneutics. Hermeneutics (meaning 'interpretation') is widely used in many contexts. In qualitative research it is used to attribute meanings to awareness. Hermeneutics can be an original philosophy, a philosophical approach to human understanding, and as a specific mode of analysis (Bleicher 1980). In my case, it provided the philosophical grounding for my interpretivism and my attempts to penetrate and understand the subtle, idiosyncratic, and personal meanings that I encountered in the

module. This study therefore is in essence a hermeneutical inquiry into the study of human conduct in a particular online course presented by means of a game.

Interpretivism

The goal of this study is to portray how the *CyberSurfiver* module worked by describing and interpreting the various interactions that took place (learner-learner, learner-facilitator, learner-content, learner-interface and learner-context). It is thus based on an interpretivist paradigm. Erickson (1986) explains the role of interpretive research in the field of education as an attempt to understand classrooms as socially and culturally organised spaces for learning, and as an attempt to make sense of what teachers and learners do, think, feel and say. Both these enterprises are integral to the process of education. Gephart (1999) states that the goal of this paradigm is to describe meanings, to understand members' definitions of the situation, and to examine how objective realities are produced. Interpretive research assumes that access to reality (given or socially constructed) is only possible if we look for it in social constructions such as language, consciousness, and shared meanings. Interpretive research is therefore fundamentally concerned with meaning as it seeks to understand and explicate the subjects' definitions of situations (Schwandt 1994).

Interpretive studies generally attempt to understand phenomena by way of the meanings that people assign to them. Interpretive research does not predefine dependent and independent variables, but focuses rather on the full complexity of human sense-making as the situation emerges (Kaplan and Maxwell 1994). Interpretivists assume that knowledge and meaning are acts of interpretation and that objective knowledge can therefore not exist apart from thinking and reasoning human beings. Even 'hard' axiomatic knowledge (such as one finds in some forms of Mathematics) depends on assumptions that human beings share in a common consensual reality.

The key focus of interpretivism is a search for *patterns* of meaning. Theories that influence this paradigm include symbolic interaction, ethno-methodology, phenomenology and hermeneutics. My interpretive research goals caused me to focus this study on how teaching and learning functioned in *CyberSurfiver*. They ensured that I described and interpreted the happenings and events as they related to teaching, learning, interaction, innovation, and assessment (Reeves 2000).

Interpretive research is mostly characterised as having a qualitative character, even though quantitative and statistical techniques may be used in this type of research. The significant differences between interpretive and traditionally qualitative research is not predicated on the kinds of data that it analyses, but rather on its underlying assumptions.

Interpretive research is hermeneutical in character. Interpretivism and hermeneutics arose in reaction to the philosophy of positivism that dominated the late 19th century and much of the 20th century as well (Schwandt 2000). Boland (1985) states that the philosophical ground of interpretive research is hermeneutics and phenomenology. Hermeneutics is the reading and interpretation of messages and texts. The term has its origins in Greek mythology because Hermes was the messenger of the Greek gods. Although the term applied originally only to the interpretation of biblical texts, its current usage includes the interpretation of secular texts in many different disciplines. The following three axioms characterise hermeneutics: (1) Written texts must be read if one is to make sense of them. (2) Written texts are open to more than one reading (or interpretation). (3) Written texts need to be read in context.

This study describes meanings, aims to understand learner's definitions of their situations, and examines how objective realities are produced (Gephart 1999). I was committed to approach the case study from the point of view of *an interacting individual* (as understood by the interpretive tradition).

The interpretive research in this study is both descriptive and explanatory. It required me (the researcher) to be reflective, self-critical, and thorough. As a result of this interpretive research, I experienced a heightened perception, increased insight, and an expanded sensitivity to what goes on in situations such as those exemplified by the dynamics and interactions of the *CyberSurfiver* learners.

The following section focuses on the design of the *CyberSurfiver* module by means of a more detailed discussion of the design experiments and the ADDIE Instructional Design model.

Design Experiments

The notion of a *design experiment*, or *design research* as it is often called, emerged about a decade ago when Brown (1992) and Collins (1992) first published articles in which they used the term. Others such as Reinking and Pickle (1993) refer to the same concept as *formative experiments*.

Design experiments have their origin in action research, and include some features of the qualitative research movement that started in the 1970s (Reeves 2000). Design experiments can be regarded as formative research that test and refine educational designs on the basis of theoretical principles that have been derived from previous research. Research experiments combine the 'engineering' of a particular form of learning or a particular design with a systematic approach to the study of this form of learning within a particular context. This approach may also be conceptualised as progressive refinement, a concept that was established by those Japanese car manufacturers who instead of waiting for a new model, rather updated their designs on a regular basis. In design experiments, this type of fine-tuning can lead to useful modifications of a curriculum.

According to Colb *et al.* (2003), design research ideally

> results in a greater understanding of a learning ecology, a complex interacting system involving multiple elements of different types and levels – by designing its elements and by anticipating how these elements function together to support learning.

This type of research addresses the complexity that is characteristic of educational settings. It focuses on learning interventions as an interacting system, rather than as a collection of activities, or a list of separate factors that influence learning.

Design experiments are not solely intended to refine practice. They should also address

theoretical questions and issues in order to be effective. Design research should always indeed strive to refine both domain-specific theory and practice.   The Design-based Research Collective (2003) argues that design-based research

> which blends empirical educational research with the theory-driven design of learning environments, is an important methodology for understanding how, when and why educational innovations work in practice.

Teaching interventions should embody specific theoretical claims about education, and should reflect a commitment to understanding the relationships among theory, the designed learning intervention, and practice.

The methodology for design experiments is still relatively undeveloped. The challenge for me in the research *CyberSurfiver* was to combine the rigor of methodically conducting a survey and implementing a number of methods of qualitative research, with the chaos in the online classroom, in such a way that it might inform future practice and contribute to theory.   Kelly (2003) argues that, as educational researchers, we find some communities that use dialects to support arguments that are directed towards confirmation, while others use dialects that support rich descriptions

that illuminate arguments about processes. Design experiments are regarded as emerging research dialect that support arguments that are constructed from the results of active innovations and interventions in the classroom.   As such, design research aims to understand the learning and teaching processes in situations where the teacher has also taken on the role of researcher.

According to Brown *et al.* (n.d.), this type of research is usually carried out in complex and 'messy situations of actual learning environments, such as classrooms'.

Because of this, there are a large number of variables that affect the success of the design.   These variables cannot be controlled. Because there are bound to be numerous variables in such situations, the design researchers may choose to pay attention only to *some* of them. A design researcher may legitimately pay attention only to the characteristics of the situation that influence only those variables that are of interest to him or her. Instead of aiming to control *all* the variables (as in experimental research), qualitative and quantitative observations are made in order to refine the design. If these observations lead the researcher to find flaws in the design, these should be addressed in conjunction with a careful consideration of all the other design elements.

Brown and Campione (1996) emphasise the fact that a design needs to be regarded as an integrated system. Design experiments should allow learners to be part of the design and research team because they bring their specific skills and insights to the design of the learning intervention.

Design experiments also produce rich descriptions that make it possible to understand what is happening and why it is happening. They focus on interventions rather than an attempts to characterise relationships and events that occur in different educational settings. Data reduction is often a problem because design researchers often collect far too much data in the form of learner assignments and even videotapes of particular scenarios.

The Design-Based Research Collective (2003) propose that design experiments should exhibit the following five characteristics:

- The goals of designing learning environments should be intertwined with the development of theory.
- The development and research should take place through continuous cycles of design, enactment, analysis, and redesign (Collins 1992).
- Design experiments should lead to theories that should be communicated to and shared with practitioners and other researchers.

- Designs should function in authentic settings and should not only document successes and failures, but should also focus on interactions that refine our understanding of the learning issues involved.
- The methods used should document and connect performance to learning outcomes.

Colb *et al.* (2003) also identify five very similar features that they feel should apply to design experiments:

- The goal of design experimentation is to develop a class of theories about the process of learning and the design that supports the learning.
- Design experiments are highly interventionist by nature.
- Design research creates the conditions for developing theories by hypothesising prospectively about the learning process and by fostering the emergence of other potential pathways for learning as the design unfolds. It furthermore also has a reflective side. This means that the assumptions on which the initial design was based are studied by analysis. If the assumptions are refuted, alternatives can be generated and tested.
- As new theories are generated or refuted, the result becomes an

iterative design process featuring cycles of invention and revision.

• The theories developed in the process of design experiments should be accountable to the activity of design and should provide detailed guidance for organising instruction.

According to Hsi (1998), design experiments:

• address learning programmes that involve important subject matter
• are usually mediated by innovative technology
• are embedded in everyday social contexts which are often classrooms
• can serve as models for broader reform
• contribute to fundamental scientific understanding of learning and education

There are a number of ways in which the *CyberSurfiver* design can be analysed. From a cognitive point of view, the summative marks of the learners are available and one can make inferences that one bases on conversations with learners as they were recorded in the data and in the material that was analysed. In terms of resources, the design of this module allowed for a variety of synchronous and asynchronous learning tools, some of which were commercially available and some of which were free. Because human resources were limited, certain support

systems were not included in the original design.

Mini-consequential tasks such as the creation of a concept map, the creation of a set of games on a particular topic, and the creation of an online learning experience, were included in the design of the module. Consequential tasks (Scardamalia, Bereiter & Fillion 1981) are tasks in which individual learners carry out research on a particular subtopic that is related to the central topics. After they have completed these tasks individually, they then share what they have learned with other learners, and prepare for, and participate in, a consequential task that requires all of them to combine their individual learning so that all members of the group will be given the opportunity to arrive at a deeper understanding of the main topic and subtopics. These consequential tasks bring the learners' own research cycle to an end. They encourage them to share knowledge across groups, and serve as opportunities for learners to reflect on and revise their previous work (Scardamalia, Bereiter & Fillion 1981). Thus, as in a jigsaw puzzle, all the pieces come together to form an understanding of the whole as the learners come up with new ideas, share what they have learned, and produce products that demonstrate their learning.

The outcomes state that when learners have completed the course, they should be

expert users of the Internet and should know how to use the web as a rich resource for teaching and learning in both synchronous and asynchronous conditions.

A further challenge to me was to integrate my role as a teacher with that of being a researcher. While actively investigating the design, I had to make modifications to the curriculum and to the teaching and learning activities on the basis of my own continuous observation and reflection. Design experiments strongly support the ideals of formative evaluation and of studying the development of learners' skills and knowledge over time. In the case of *CyberSurfiver*, I revisited and revised curricular and instructional decisions on a weekly basis.

In more traditional summative evaluations, a learning intervention is typically measured against a set of criteria or standards (Worthen, Sanders & Fitzpatrick 1997). In a design experiment, repetitive cycles of development, implementation, and research allow the researcher to gather information about the extent to which the design is succeeding. By gaining this kind of formative feedback, the designer is given the opportunity to improve the design of the intervention. It is thus acknowledged that, even though a number of formative adaptations have already been made on the basis of the first cycle of implementation, many more of these cycles

may be needed to ensure optimal learning because one has achieved the best possible design under the circumstances.

Design research regards success only as a joint product of design interventions and context. There is thus more at stake than the simple improvement of a particular learning intervention. The intention of the design experiment is to inquire more broadly into the nature of learning in a complex system, and thus to refine theories of learning in the process.

In this study, the design research was carried out in the following way. Initially I studied intensively a number of the *Survivor©* episodes on television so that I could confidently identify the various components that made up the game. I then identified the basic elements of the *Survivor©* metaphor, and worked out how these elements would interact with each other in our academic setting. I based my framework on existing theories of motivation (both active and collaborative) and on constructivist learning premises. By the time I had created the framework and planned the format and logistics of each successive week, it was already time for the module to begin. By that time, only the first week's assignments had already been fully designed and developed, and although all the assignments for the other weeks had been conceptualised, they were still not in a format that was complete. I was thus in the

position to intervene by implementing the design in the first week, analysing the learning processes that were generated, and redesigning the next week's activities on the basis of my findings. Learners provided constant feedback, both overtly and covertly. *CyberSurfiver* thus performed as a prototype for this kind of innovation.

The module began with a certain amount of chaos and misunderstandings for reasons that will be discussed in more detail in chapter 5. I identified and addressed the areas of the design that had created problems and thereafter modified the initial design by scheduling a synchronous face-to-face meeting at the beginning of Week 2.

This modification in the design heralded the beginning of a new phase. Chapter 5 will describe the various phases, its critical elements, and the reasons for making moderations. The initial modification was only the first of many repetitions that had to follow because many of the changes had not yet been tested in practice.

As a result of this study of the dynamics and the various types of interactions that took place on CyberIsland, I were able to contribute to the existing literature by reporting on my findings. In the chapters that follow, I show how the design affected the performance of the learners with regard

to the outcomes that had been set for the module.

As a design experiment, *CyberSurfiver* aimed to explore the possibilities for creating a novel teaching and learning environment by using the metaphor of a game that was played out over the Internet. It also intended to contribute to the establishment of a number of theories about online learning. *CyberSurfiver* proposed to advance and consolidate our common knowledge about design and increase the capacity for educational innovation in web-based environments.

In the case of *CyberSurfiver*, the design research has contributed to a deeper understanding of design knowledge and practices as they apply to naturalistic settings. It connected the game metaphor design with the educational outcomes that were specified. The study has contributed to usable knowledge about, and reform of, online instructional practices.

Design experiments provide educational researchers with an alternative model for conducting research because they address the complex nature of learning in classrooms; they extend basic research in cognition; they promote a broad systemic understanding that is able to transform a variety of teaching and learning environments, and they provide valid examples of successful educational transformation.

Design model: the ADDIE instructional design model

The ADDIE model (Gustafson & Branch 1997) is a simple and generic instructional design model that consists of analysis, design, development, implementation, and evaluation phases. This study employed a modified ADDIE model, which borrowed from the most valuable aspects of the above-mentioned systemic approach but which allowed for a less linear systems approach.

During the analysis phase, I developed an understanding of the learning environment and identified learner characteristics. I investigated the technologies that were available for use and reflected on the learners' existing knowledge and skills. I clarified the instructional problem and established the goals and outcomes. In the design phase, I documented the specific learning outcomes, assessment instruments, learning activities and structure of the module, and I made various media choices. The actual creation of the learning environments and learning materials were carried out in the development phase according to decisions that had been made during the design phase. During the implementation phase, the learning activities were revealed to the learners with appropriate levels of cognitive and affective scaffolding. The evaluation phase consisted of two parts, namely, a formative and a summative evaluation.

Formative evaluation was present in each stage. After the module had been completed, the effectiveness of the module and the learning materials were evaluated by means of an analysis of the various sets of feedback that was provided by the learners over the six-week period.

Needs Analysis (<u>A</u>DDIE)

The *CyberSurfiver* module was created on the basis of a number of assumptions that guided the design, the development and the implementation of the module. Dey (1993) states that a balance must be struck between one's own prejudices and assumptions and one desire to carry out intelligent and innovative research.

> There is a difference between an open mind and empty head. To analyse data, we need to use accumulated knowledge, not dispense with it. The issue is not whether to use existing knowledge, but how [...] The danger lies not in having assumptions but in not being aware of them.

Because I was a guest lecturer who had been brought in from outside the University to facilitate this module, there were some details of the module about which I was unaware. Without expecting any problems, I carried out my preparations for the module on the basis of various preconceived notions that I had

internalised from my own experience of having been a learner in the same module a couple of years earlier.

I took it for granted, for example, that the target learner group comprised the master's degree students who had enrolled for this particular module. What I did *not* know was that many of the learners were not part of the regular intake of learners for that particular year. Some learners were already in their second year of the master's degree, and were repeating the module because they felt they needed more exposure to the world of online learning. Others were lecturers from the University of Pretoria who had displayed an interest in elearning and who wanted to learn more about web-based learning with the intention of implementing an elearning strategy in their own courses. One learner had to attend the contact sessions in his capacity as student assistant to the course coordinator. His duties in the online section of the course were thus simply administrative. I was thus unfamiliar with the divergent characteristics of the learners in both the design and development phases. I only realised this with some clarity during the course of the module as learners informally interacted with myself in e-mails and instant messages. The module had been designed on the premise that (1) all learners would be master's degree students in their first year of the course, and (2) that they already knew each other.

The *CyberSurfiver* module was designed with the aim of directing the learners on a voyage of discovery. The module aimed to provide learners, while they were on this journey of discovery, with opportunities to construct their own knowledge about the educational advantages and weaknesses of the Internet as a learning environment. The specified outcome of the module was that learners would be able to apply their knowledge about the Internet and its functionalities in an appropriate way in their own teaching, training and learning environments.

After some brainstorming sessions with Professor Cronjé, I created a concept map based on the elements of the *Survivor©* show on television, on existing literature that deals with online adult learning, and my own prior experience in teaching online courses. The map provided a structure for the design of the module that followed. As the module was about the topic of elearning, and I firmly believe in the value of creating an authentic learning environment, the decision was made to present the course online in its entirety. In previous years, this particular module had also been presented online, and thus all learners knew that this was in essence a distance education module. As learners were already using *Yahoo Groups* as their main communication tool, and were already familiar with its basic modes of operation, it was decided that *CyberSurfiver* would also initially use this free service as its home base. This, however, turned out to be another

erroneous assumption because many learners had only subscribed to the e-mail version of the group. This assumption will be dealt with in more detail in chapter 4.

Because one of the specific outcomes of the module was to expose learners to a variety of Internet-based tools, services, products and applications, I wanted learners to experience both commercially available and free products. Because the University of Pretoria uses *WebCT* as its learning management system, this system was available for use in *CyberSurfiver*. Previous contact with the management team of *InterWise* also ensured a free demonstration session of how to use this tool in return for the marketing exposure that the company would get from the session. Most of the other applications that were going to be used were available as 'freeware' from the Internet. As much of the module was devoted to becoming familiar with the resources that were available on the Internet, learners would be encouraged to find existing electronic material instead of paper-based text books and journal articles.

The timeline for the design and development overlapped with the actual implementation of the module. While the main structure of the module was completed by the time the module started, the details of the assignments and learning activities were designed and developed as the module progressed. Even though this approach allowed changes to be made to the original design on the basis of

learner and other feedback, it restricted the amount of time available for other kinds of interaction and innovations.

I anticipated on the basis of numbers provided by Professor Cronjé that about 20 learners might be expected to enrol for the module. I also expected that the group of learners who would manifest diversity in terms of home language, culture, age, race, and gender. I knew that all the learners were adults, that they all worked full time, and that many of them had to cope with family responsibilities on a daily basis. I thus realised that the master's group would be extremely diverse in terms of age, gender, culture, prior experience, and background – to name but a few variables.

Because all of the learners were employed full-time, they would all be part-time learners with work-related responsibilities. Since I was employed in a teaching environment, I anticipated that most of them would have Internet access, at least from work. This could not however be verified before the module started, and I was therefore uncertain about whether or not learners would have access to computers that could be connected to the Internet.

From my own experience of the course in previous years, I knew that there would be diverse entry levels insofar as computer and Internet literacy was concerned. The experience of earlier years had shown that

CyberSurfiver learners came to the course with a widely divergent range of computer and Internet skills and degrees of computer literacy. Since I knew that all these learners were students who were enrolling for the *computer*-integrated degree, I assumed that they would all at least have a basic understanding of Internet literacy (i.e. that they would be able to send and retrieve e-mails, attachments, etc.) and that they would possess a minimum level of computer literacy (i.e. that they would be able to function with some degree of skill in a Windows environment).

As it is widely known that the master's degree is administered by hard taskmasters who throw their learners in at the deep end and expect them to work collaboratively if they want to survive, I also took it for granted that the learners would be accustomed to this mode of andragogy by the time the module began in the second half of the year. As the module is part of the master's degree, I expected that most of the learners would be self-directed and mature and possess ample intrinsic motivation and a willingness to participate actively on a daily basis.

I also predicted that many of the learners would be from a teaching or training background because the pre-requisites for the degree include a teaching qualification of sorts. I also realised that many of the learners might well be from educational backgrounds in which the constructivist style of teaching and learning is still both novel and frightening because most education in South Africa in past decades conformed rigidly and even punitively to traditional and teacher-centred models.

Even though most of the learners were employed in the educational environment, I doubted whether any of them would have had any extensive elearning experience. This assumption was based on the limited infrastructure that is available, especially at school level, and on the limited bandwidth problems that are endemic in South Africa.

Since the majority of the learners were teachers, I made the assumption that many of the learners would be working and living under the pressure of (sometimes severe) financial constraints and that being online for long periods of time in South Africa would be an expensive requirement for them, to say the least.   Also,   teachers   are   notoriously underpaid in South Africa.

Since our resources were limited, we could not count on the luxury of pulling a variety of experts   together   in   a   fully-fledged development team.   Because of these circumstances, Professor Cronjé acted as course creator, coordinator and monitor, while I performed the various roles of subject matter   expert,   curriculum   designer, instructional designer, facilitator, technical supporter, game master and researcher.

Although technical support for the learners was not in place, I had access to limited technical support because I was given permission to to set up a space on the experimental server (called Hagar) for the CyberIsland. Learners who elected to work on campus would also have access to support from the university's computer laboratory assistants.

I anticipated therefore that all learners would have daily access to a computer that would be connected to the Internet. If perchance there were learners who wanted to learn about elearning but who did not have access, the laboratories on campus would be able to provide them with the necessary access. I also thought it likely that most learners would have access to a word processor.

The only other technology needed was a sound card, speakers and an optional microphone. I thought that it was probable that most learners would have at least a sound card and speakers, and as a microphone could be bought for less than R80,00, I did not think that the costs would be exorbitant.

Design of the module (A_D_DIE)

The design of this module was based on constructivistic pedagogical principles and self-directed learning and included a variety of modes such as individual assignments and small group collaboration.

The *CyberSurfiver* module was designed to provide a high-quality learning environment that encourages discovery, integration, application, and reflection. The design specifically focussed on providing opportunities for interaction among the learners themselves, and between the learners and the facilitator. It was designed to create an environment that fosters critical dialogue, integrative learning, mentoring and support, cooperative peer learning and a great deal of exposure to web-based learning activities.

For planning and development purposes, instructional designers are encouraged to build into their programmes strategic amounts of each type of interaction and to develop activities that will encourage the envisaged interaction (Anderson 2002). I therefore incorporated into the *CyberSurfiver* design appropriate opportunities for learner-learner, learner-facilitator, learner-content, learner-interface, and learner-context interactions.

As the module was presented to adult learners with varying degrees of intrinsic motivation, I also created opportunities to stimulate learners with external motivators such as rewards and competitions.

Even though the module may be described as a distance learning experience, it was not

designed to be self-pacing. Since the success of the module closely depended on a good deal of collaboration among learners, learners had to synchronise their learning activities to the weekly activities.

Despite the importance of transfer of learning in education, learners often do not transfer what they have learned in a formal setting into their daily lives (Thurman, 1993; Brown, 1989; CTGV, 1992a, 1992b; Van Haneghan 1990). Some researchers attribute the failure to transfer learning to a lack of similarity between the learning and performance contexts (Osgood, 1949), a lack of previous experience with similar problems, and insufficient instruction on how to conceptualise and solve problems (Rogoff & Gardner 1984). The *CyberSurfiver* module was therefore designed to provide learners with the opportunity to experience online learning at first hand, and incorporated the principle of learning from personal experience. Learners were experiencing the elearning environment from a learner's perspective. The design of the module also included reflective exercises that would help learners to extrapolate from their *learner* experiences to what they would or would not do in both teaching and learning in an online environment.

My own personal teaching philosophy (socio-cultural constructivism) also strongly influenced the design. Duffy and Cunningham (1996) explain this belief as follows:

> Learning is an active process of constructing rather than acquiring knowledge, and instruction is a process of supporting that construction rather than communicating knowledge.

I believe in a learner-centred approach that includes self-directed learning and educational experiences in which learners can take increased responsibility for their own learning. I believe strongly in the value of in creating an online community of practice, and in active learner participation.

The rest of the design of the *CyberSurfiver* module is explained in more detail in chapter 4.

Development of the module (AD̲DIE)

No single learning management system could supply all the tools and services that all teachers and learners would want or even need to use. Because of this realisation, I included a number of tools, products and services in order to provide learners with opportunities to explore the strengths and weaknesses of the various applications that were available commercially and as 'freeware' from the Internet.

Because (as I have explained above) the learners were already accustomed to using *Yahoo Groups*, I designated this asynchronous tool for use as 'the base camp' for the first week on CyberIsland. Throughout the game, files, such as the introductory comments about the game, spreadsheets with marks, and assignments, were uploaded to this site. *Yahoo Groups* also functioned as the main asynchronous communication medium throughout the module. As the Group was already set up, no further development was necessary apart from the *CyberSurfiver*: Introduction document and the first week's assignments that I uploaded to this site before the first contact session began. I also added new documents as the weeks passed.

Yahoo Messenger was introduced in the second week on CyberIsland, and the only development that was needed here was the document that explained how this tool was to be evaluated by learners as part of a group learning activity.

I introduced *WebCT* in Week 4. This learning environment needed some preparation and development work. After the *WebCT* administration had created a 'course' for this particular module, and it had been uploaded for the learners, I spent some time in developing an appearance and atmosphere for this 'virtual classroom'. I also duplicated everything that was posted to *Yahoo Groups* because I wanted learners to be able to

experience the difference between *Yahoo Groups*, a free service, and *WebCT*, a commercial learning management system.

With funding from the National Research Foundation, a BTech Information Technology student was tasked to programme the Voting and Assessment Stations for *CyberSurfiver*. He created both stations by using PHP (a general purpose scripting language that is particularly well suited for web development).

Apart from *InterWise*, the other applications that were used were all free services that are available on the Internet. I tested all these free tools and products to ensure that they would support all the various activities that were required by individual and tribal assignments. The *InterWise* session was arranged with the management team of the local distributors, and guidelines for downloading the client software and other preparations were drawn up collectively.

Implementation (ADD<u>I</u>E)

Chapters 4 to 7 will provide the reader with further information about the implementation phase because in them I will describe in necessary detail the dynamics that occurred between the learners, myself, the technology and their own environments.

Evaluation (ADD<u>IE</u>)

Throughout the six weeks of the module, formative assessment took place and adjustments were made to the design of the module on the basis of feedback from learners. But because time was limited, not all the suggested changes could be accommodated this time around. The next two chapters will indicate that there are a number of changes that still need to be made to the existing design. Many of these changes have to do with creating a less stressful learning environment, with more scaffolding and technical support to supplement the original design. The summative evaluation is currently limited to the data analysis that is reported in this study. I shall also undertake a formal evaluative study based on Tom Reeves' pedagogical dimensions (Reeves 1997) in the near future, but that is not part of this study.

Tapping into ethnography

In many quarters, ethnography has come to be regarded as synonymous with qualitative research (Chambers 2000). However, Wolcott (1995) defines it much more narrowly to refer to those varieties of inquiry that describe or interpret the place of culture in human affairs. Although 'culture' itself has become an ambiguous term that is subject to a variety of interpretations, I agree with Chambers (2000)

who states that culture is composed of those understandings and ways of understanding that may be judged to be characteristic of a discernable group.

Ethnography is in essence a method of studying and learning about a person or group of people. According to Spradley (1979), ethnography means describing a culture.

Typically, it involves the investigation of a small group of subjects in their own environment (in the case of *CyberSurfiver*, this is the online environment). The ethnographer attempts to obtain a comprehensive understanding of the circumstances of the few subjects being studied, instead of looking at a small number of variables with a large number of subjects.

While this approach is commonly used by anthropologists to study foreign cultures or primitive societies, Spradley (1979) suggests that it is a valuable means for 'understanding how other people see their experience'.

Ethnographic research is both descriptive and interpretive.   It is *descriptive* because detailed, extensive and layered descriptions are essential, and *interpretive* because the ethnographer should determine the significance of what is observed without necessarily gathering statistical information.

Massey (1998) identified the following seven essential characteristics of ethnographic research:

- It is a study of a culture.
- It uses multiple methods and diverse forms of data.
- It manifests *engagement*.
- It regards the researcher as an 'instrument'.
- It produces multiple perspectives.
- It progresses through a cycle of hypothesis and theory building.
- It includes intention and outcome.

In *CyberSurfiver*, the 'culture' we are dealing with is a product of the dynamics of the online learning community. The module provided me with a diversity of materials and events that I could examine by using several methods such as focus groups and a survey. Because of the multiple roles that was fulfilling, I became an active participant rather than simply an objective and distant researcher. Woods (1994) regards *engagement* as one of the most prominent features of ethnographic research.   He states that it is a 'long-term engagement in the situation as things actually happen and observing things first-hand'.

Spindler and Spindler (1992) agrees that the 'requirement for direct, prolonged, on-the-spot observation cannot be avoided or reduced. It is the guts of the ethnographic approach.'

The ethnographic principle of engagement is guided by two elements: human connection with participants and an investment in time (Massey 1998). As a researcher becomes a familiar presence, the participants may behave more in accordance with their true characters and be less guarded in their responses. To become part of this culture takes time because both participants and settings need time to show what is going on.

Wilcox (1982) stated that the goal of ethnography is to

> combine the view of an insider with that of an outsider to describe a social setting.   The resulting description is expected to be deeper and fuller than that of the ordinary outsider, and broader and less culture-bound than that of the ordinary insider.

In my role as facilitator, I became closely involved with the learners over the six-week period that the module ran. As such, I could interpret the material that was generated during the course of the module both more deeply and fully than the other researchers who studied this module as 'outsiders'.

To my own perspectives (based on my diverse roles as designer, facilitator and researcher), the learners and my research collaborators all brought their own

perspectives. Massey (1998) argues that because the world is experienced *subjectively*, subjectivity is an inevitable feature of ethnographic research. In spite of this, the researcher should work systematically and constantly review the evolution of his or her ideas. He or she should also reflect on why certain choices were made, why certain questions were asked or were not asked, and why research materials were generated in a particular manner.

As each person's view of the world is unique, the ethnographic researcher needs to be open-minded and prepared to challenge existing theories and understandings. All claims about a culture that is being studied must be based on some kind of empirical evidence provided from that culture itself.

Ethnography is characterised by its commitment to modify hypothesis and theories in the light of new data. In *CyberSurfiver*, this concept has been embedded in the formative nature of the design experiment. This type of research was therefore a process rather than an event. As new information presented itself, existing suppositions proved inadequate asking for 'running interaction between formulating and testing (and reformulating and retesting) (Gold 1997).

The *CyberSurfiver* study was intended to provide learners with the opportunity to become familiar with the elearning environment, and evidence of this outcome is apparent in the tribal and individual assignments that they completed.

Ethnography is the study of a culture that is comprised of certain values, practices, relationships and identifications. Researchers who base their studies on an ethnographical approach have to interact with other (often strange) social worlds as empathically as possible. To understand the behaviour, values and meanings of any given individual in the *CyberSurfiver* group, the researcher had to take the cultural context into account.

Because online learning communities, such as *CyberSurfiver*, are complex and multi-faceted, a researcher has to study them by using multiple methods and diverse forms of data in order to 'develop the story as it is experienced by participants' (Woods 1994).

Researchers who use an ethnographical approach need to consider multiple sources of data. These include the researcher's own field notes, video and audiotapes, quantitative data such as survey findings, and other written documents and sources. In *CyberSurfiver* these data sets are generated by using multiple methods that include focus groups, observation, and assembled artefacts.

I opted to incorporate the ideas of Chambers (2000), who states that the value of

ethnography lies in its narrative, in its telling of a story that is based on cultural representations. The *CyberSurfiver* study does not simply tell stories about the online module. It aims to describe what happens in an online course as the result of deliberate interventions such as those that occurred in the *Survivor©* metaphor.

Certain elements of ethnography played an important role in framing the research for the *CyberSurfiver* study in that its aims, methods, possibilities, and problems contributed to a better understanding of the dynamics and various interactions that were involved on CyberIsland.

Research design: case study

The *case study* has been hailed as a major methodological tool in social science inquiry and as a distinctive means for providing valid social knowledge (Sjoberg *et al.* 1991). The term *case study*, however, has multiple meanings. It can be used to describe a unit of analysis or to describe a research method. Stake, in Denzin and Lincoln 2000, argues that a 'case study is not a methodological choice but a choice of what is to be studied. By whatever methods, we choose to study the case.'

In this study, the *CyberSurfiver* module was selected as a unit of analysis for a variety of

reasons, among which is the fact that the module provided a scenario in which adult learners could learn by means of the *Survivor©* metaphor *in an online environment*. As a research method, the case studies employed various methods such as focus groups, observation, and surveys. The goal of these methods was to reconstruct and analyse the case from an educational perspective.

With the advent of modern qualitative techniques and the large-scale use of these techniques in the social sciences, the case study has been employed as a useful and important strategy for social analysis. In this section, I will provide a reasoned rationale for using the case study approach. I shall discuss the issue of methods in the social sciences from a broad philosophical perspective and will provide a justification for the significance and widespread use of case study methods.

Feagin *et al.* (1991) define the case study as an 'in-depth, multi-faceted investigation, using qualitative research methods, of a single social phenomenon. The study is conducted in great detail and often relies on the use of several data sources.'

They further state that the case study is an ideal methodology when a holistic investigation is needed. This reasoning indicates that the appropriate strategy to have followed in the *CyberSurfiver* study was

that of a case study. Snow and Anderson (in Feagin *et al.* 1991) also state:

> The quintessential characteristic of case studies is that they strive toward a relatively holistic understanding of cultural systems of action. By cultural systems of action, we refer to sets of interrelated activities and routines engaged in by one or more networks of actors within a social context that is bounded in time and space.

Their holistic approach is therefore a prominent feature of case studies. It seeks to understand people as they experience their natural everyday circumstances. It offers the researcher empirical and theoretical gains in understanding larger social complexes of people, actions, and motives. Any part of a system can only be understood within the context of the entire system. It was therefore important in this study to refrain from trying to understand any part of the group in isolation. To remove any discussion from the *total* context would have produced distortion. I avoided analysing the parts of the group communication out of context because the components can only be understood in the light of the system as a whole.

A case study usually assumes a world of complexity and plurality than a world of simplicity and uniformity.   It assumes a

richness of texture and subtlety of nuances in social worlds.

Palmquist (2002) states that the term case study refers to

> the collection and presentation of detailed information about a particular participant or small group, frequently including the accounts of subjects themselves. A form of qualitative descriptive research, the case study looks intensely at an individual or small participant pool, drawing conclusions only about that participant or group and only in that specific context.

Lincoln and Guba (1985) describe the case study structure as consisting of a problem, a context, the issues, and the lessons learned. Creswell (1998) characterises a case study as

> an exploration of a 'bounded system' or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context.

Yin (1989) observed that the case study investigates a phenomenon within its real-life context while permitting uses of multiple sources of evidence by the researcher. One of the principal arguments for the use of a case study is that it provides a way of studying

human events and actions in their natural surroundings. The case study enables a researcher to make observations about people as they go about their real-life business. For this study, the *CyberSurfiver* module provided the researcher with a real-life online learning community that could be examined by means of the multiple sources of data and material that the module generated. It enabled me to record interactions as the learners engaged in online learning activities.

The benefit of the case study in the current research is that it enabled me to make a rigorous and holistic investigation of the dynamics that ensued as adult learners played a difficult game in an online environment. This study used the case study method because the online module presented contextual material with clear-cut boundaries and because the setting of the case could be clearly delineated (Creswell 1998). A large amount of information about the case was available which further deepened the overall picture. I used the *CyberSurfiver* study to examine the interplay of variables and to provide as complete an understanding of the dynamics as possible.

This research also focussed on a single case study as opposed to a collective, multi-sited or within-site case study.   Leedy's (1993) definition of a case study is assumed in this research. He writes:

Sometimes researchers focus on a single case, perhaps because its unique or exceptional qualities can promote understanding or inform practice for similar situations.

It was decided to focus on one case only in order to keep the overall analysis clear and specific, and to avoid lack of depth or the dilution of the overall analysis. Although a large number of cases might have strengthened any attempt at generalisability, this term holds as little meaning for this particular study as it does for many other qualitative researchers (Glesne & Peshkin 1992).

Case studies present a number of unique characteristics. *CyberSurfiver* provided the opportunity to carry out the analysis from multiple perspectives.   This means that I considered not only the experiences of the learners as my primary focal concern, but also my own perspectives and those of the course co-ordinator and my fellow researchers. The case study focused on the holistic analyses of *CyberSurfiver* as a bounded system.

Case studies make a greater allowance for an analysis of actual social processes than do other modes of research. The case study is typically longitudinal as it is conducted over a period of time. This facilitates the possibility of capturing and analysing events and

happenings, interactions and relationships, and groups as they emerge and evolve across time.   In the six weeks that *CyberSurfiver* ran, the intensity of the pace and the opportunities for collaboration provided a wide range of interactions for purposes of analysis.

Case studies have an open-ended emergent quality that facilitates the discovery of unanticipated findings and data sources. The case study usually begins with a broad, general set of questions about the phenomena under investigation and then becomes more focussed as the research progresses.   Initially they are explorative, but eventually serendipitous components may lead to formulate new questions and foci for investigation.   This makes for a dynamic, recursive research process. In *CyberSurfiver*, many aspects that are dealt with in chapters 4 to 7 only surfaced after many cycles of reiterative reading and rereading of the materials had been made.

Various criticisms of case studies are quite regularly made. The personal interpretation of a single investigator may be vulnerable to criticism on various counts. The researcher is often intimately engaged with a study, and this might make it susceptible to the idiosyncratic biases of an investigator. A case study can invoke no more general principles than those supplied by its own data. By using a team approach with more than one

observer, one can minimise such a weakness. If several observers are employed, and each compares and crosschecks his or her findings against those of the others, this obstacle may be overcome. While I do not deny that my subjectivity and biases may have influenced my findings, I have tried to declare my biases as openly as possible, and I have triangulated my findings by confirming my interpretations by investigating other sources such as the data sources my research collaborators. In the *CyberSurfiver* study, the three research collaborators investigated the case study from different points of departure, and they constantly crosschecking their findings with one another.

The costs involved in studying a smaller group of subjects in greater detail and depth would have been problematic. In *CyberSurfiver*, the costs of being online for long periods of time had serious financial implications for nearly all concerned. However, since being online was an essential part of the entire process, both in terms of the design and the implementation of the module, it was necessary to incur these expenditures.

Case studies cannot cast light on propositions that are derived from prior research and on variable interrelationships. Single case studies have some limitations in this regard. However, even single case studies can provide some proof of links between phenomena. If the detail and depth of the research enables the

researcher to propose a highly suggestive theory on the topic, it might well point the way to further work by other students.

Insufficient quantification could also be seen as problematic. Limited ability to prove relationships between variables because of the absence of statistical data is regarded as another problem in this context. In defence of case studies of this kind, I agree with Cooley (1930) when he states that a purely statistical approach does not take us far in understanding human beings in their wholeness. The qualitative nature of a literary narrative approach can also be precise and disciplined. A case study permits the researcher to examine the complexities of life as well as the impact on beliefs and decisions in a complex web of social interactions. This type of study allows the researcher to discover how systems of interaction networks develop and operate, and it also allows the researcher to study how learner's individual roles that emerge out of interactions among other learners. In *CyberSurfiver* I was able to discover social interactional patterns that occurred among these learners by using qualitative measures.

Generalisation is not one of the characteristics of case studies. Kaplin (1964) states:

> Generalization must be truly universal, unrestricted as to time and space. It must formulate what is always and

everywhere the case, provided only that the appropriate conditions are satisfied.

It is therefore understood that generalisations must be a-historical and context free. This makes it impossible for case studies, with their commitment to the contextualisation of social action and process, to be fully generalisable. An aim of the *CyberSurfiver* study was not to be able to produce generalisable findings. This will be discussed in more detail in a later section.

Case studies, however, also present a number of possible advantages. More detailed information of a three-dimensional kind is made possible by case studies than by statistical analysis. The case study is a flexible scientific tool that permits textured data that contains a richness of depth in the description and analysis of events. Case studies seek to record interactions by framing them within interpretive categories that are complex, nuanced, flexible, subtle and open to reiterative *ex post facto* adjustments.

This particular case study has a number of exceptional and unique features that made it ideal for in-depth study. In its first cycle of implementation, it may have presented with a number of design issues that needed to be straightened out. But because imperfections were identified in *this* case, future practices

may benefit by being better informed from the outset.

I concentrated in this study on the effect of the introduction of the *Survivor©* game elements on the elearning experience of the adult learners enrolled for the module. In my unique position as a guest lecturer, I could afford to experiment with different teaching strategies other than the ones learners were traditionally accustomed to experiencing. In addition, the MEd Computer-Integrated Education degree is known for the controversial teaching methods that have often been applied in classes. It was therefore an ideal course in which to test the influence of a metaphor such as *Survivor©*.

The readers of this *CyberSurfiver* thesis should be able to observe the learners at close range and get a sense of what drove them. In this study, I observed, reconstructed, and analysed the *CyberSurfiver* case. I studied individual and collective interactions, common patterns of behaviour, and social structures. The case study method was therefore appropriate because it strove to 'highlight the features or attributes of social life' (Hamel 1993).

I identified the common patterns of behaviour, beliefs, and rituals that characterised the life of an online learning community in its various manifestations. This was investigated and understood by

attentively observing the behaviour of the learners in the *CyberSurfiver* community. It furthermore required an understanding of the meanings that learners assigned to their own patterns of behaviour, beliefs, and the rituals prevalent in the elearning community. Many of the observations were informed by the reflections of the learners.

As the facilitator, I became integrated with the group of learners and had regular contacts with them over the six weeks during which the module was presented. I became involved in their daily lives and customs. As Becker (1970) states:

> To understand an individual's behaviour, we must know how he perceives the situations, the obstacles he believed he had to face, the alternatives he saw opening up to him.

First-hand observations and information were meticulously noted in both field notes and a research diary, and were recorded in a way that I hoped would faithfully mirror the peculiarities of the *CyberSurfiver* community.

The advantage of case studies is that researchers who utilise them can deal with a perceived reality behind appearances, with the contradictions and dialectical nature of social life, as well as with a whole that is more than the sum of the parts. The case study

approach provided me with fundamental sociological insights into the dynamics generated by learners and their elearning communities.

Data/material collection

Each of the research methods discussed above uses one or more techniques for collecting empirical data. These techniques include interviews, participant observation, and fieldwork.   In *CyberSurfiver*, multiple sources of information were gathered in the data collection phase in order later to provide the basis for the detailed picture of the dynamics and interactions that took place during the module.   The data collection procedures that were employed permitted the researcher to examine the phenomenon in great depth and detail.

The sources were tapped by a combination of methods that ranged from participant observation and informal conversational interviewing to the systematic surveying of written and auditory records.   In the table below, the various data collection sources that were used are tabulated.

Table 8: Sources of data

Source	Clarification
Electronic group messages	*Yahoo Groups* offers a group service that allows both facilitators and learners to send public messages to others in the group. Although these messages can be accessed on the web in a bulletin board mode, group members also have the option of receiving the messages in e-mail format (as if a listserv). Most of the communication in this module took place by means of this technology.
E-mail messages	The *WebCT* learning management system was introduced at a particular point during the module. A number of learners used the *WebCT* e-mail facility to communicate, mainly with the facilitator. The facilitator also made her private and work e-mail addresses known to the learners. These addresses were often used in private discussions that took place privately.

Source	Clarification
Instant messages	*Yahoo Messenger* allowed learners to send instant messages to each other and to the facilitator when they were online at the same time. At times offline (asynchronous) messages were also sent and received. The messages sent to and from the facilitator were used as a source of information.
Sound files	Individual Assignment 4 required learners to produce a sound file of approximately 30 seconds in which they were asked to give their impressions of the first week on the CyberIsland. These sound clips had to include at least one positive and one negative comment.
Formal test responses	Many of the responses to questions asked in the formal electronic test during week six of the module contained valuable insights into the learners' thinking about a number of issues relating to the course. The responses to one question in particular were used: *Evaluate our eLearn2002 community against the 8 foundations for building and growing successful elearning communities*.
Survey responses	As one of the incentives to get the facilitator to mark their tests, learners had to complete a survey that aimed to investigate their feelings and responses with regard to a number of issues concerning the way in which the module was presented.
Personal conversations	While these were limited to the three contact sessions (tribal councils), many personal conversations also took place by means of private e-mails and instant messages.
Academic articles	Individual Assignment 13 required learners to write a publishable article on a topic related to their experiences in the module. These articles provided valuable insights into learners' experiences of the module.
Individual home pages	Each week learners were asked to add technologically challenging features to their web sites that were hosted on a server called Hagar. These sites were utilised as a source of information.

Source	Clarification
Questionnaires	A fellow researcher requested learners to complete a paper-based questionnaire that related to their affective experiences during the module. These results were also incorporated in the study.
Video of final contact session	The module concluded with a final Tribal Council meeting which was video-taped. The main purpose of the meeting was two-fold: to announce the final Grand Prize 'Surfiver', and to conduct an informal debriefing session. The video was transcribed and analysed.
Field notes and research diary	These included notes about the pedagogics of the module made by the facilitator as the module progressed and other research-related notes made by the researcher during this time.
Focus groups	A consultant hired by the co-researchers in the team held two focus group sessions. The results of these sessions were transcribed and used in the analysis phase.

Case studies are likely to be much more convincing and accurate if they are based on several different sources of information that are patterned on a corroborative mode (Selfe 1985).   Cross-checking data from multiple sources helped to provide a multidimensional profile of composing activities in the *CyberSurfiver* case study.   Merriam (1985) suggests

> checking, verifying, testing, probing, and confirming collected data as you go, arguing that this process will follow in a funnel-like design resulting in less data gathering in later phases of the study along with a congruent increase in analysis checking, verifying, and confirming.

According to Patton (1987),

> the evaluation of any research data should take into consideration a multiplicity of evidence gathered through numerous data collection methods and incorporate both quantitative and qualitative methods.

One of the distinctive features of this study is the number of data sources that were available for both quantitative and qualitative analysis. Multiple sources of information in the data collection phase were used to provide the detailed in-depth picture of the dynamics that took place while the online module lasted.

The data sources (such as e-mail, bulletin board and voice messages) were tapped by a mixture of methods ranging from participant observation and informal conversational interviewing, to a systematic consideration of written and auditory records.

Typically, a case study researcher uses interviews and documentary materials without using participant observation. The distinguishing feature of an ethnographical approach is that the researcher spends a significant amount of time in the field. The fieldwork notes and the experience of living there become an important addition to any other data gathering techniques that may be used.

Case studies and design experiments permit the researcher to assemble complementary and overlapping measures of the same phenomena. In this study, a large variety of data sources were available to investigate and analyse. These sources were used to assess the nature of particular events, as well as the motives and interests of learners. Sources were used to cross-check and thereby to confirm observations as well as claims based on those observations.

In order to preserve the atmosphere, excitement, and flavour of the original exchanges, the content of learner quotations in the chapters that follow has not been touched up or improved upon. Where necessary, though, for easier reading, punctuation, and spacing were included and obvious typing and spelling errors were corrected. This practice is called the 'silent correction of quotations' and is regarded as a legitimate editorial practice.

Mode of analysis

Most of the modes of analysis in qualitative studies are concerned primarily with textual analysis, whether it is in verbal or written form. As a mode of analysis, hermeneutics suggests a way of understanding textual data. The Oxford English Reference Dictionary (1996) defines hermeneutics as:

> The art, skill, or theory of understanding and classifying meaning. A hermeneutic inter-pretation requires the individual to understand and sympathize with another's point of view.

Hermeneutics, as an analytic data technique, is the theory and methodology of textual interpretation and explanation. According to Radnitzky (1970), the most fundamental question in hermeneutics is: 'What is the meaning of this text?". It is axiomatic in hermeneutical practice that it is not possible properly to understand any one part of a work until one has understood the whole. But conversely it is not possible to understand the

whole without also understanding all of the parts.

Taylor (1976) states:

> 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.

There is an inevitable degree of subjectivity in the hermeneutical analysis and arrangement of the data that is mined. Ethnographers respond to charges of subjectivity by emphasizing that their approach avoids preconceived frameworks and derives meaning from the community informants themselves. Qualitative methods such as survey instruments, on the other hand, often reflect the preconceived conceptual categories of the researcher before the actual encounter with respondents.

Initially, based on my experiences during the six weeks, I jotted down a number of themes that I anticipated would surface in an analysis of the data. However, rather than relying too heavily on my preconceived framework for gathering and analysing data, I used my

interactions with the learners to discover and create an analytical framework for understanding and portraying dynamics and interactions.

An important part of this process is the hermeneutic cycle. The process entailed, for instance, that I read a posting, an e-mail, or an answer to one of the questions in the online test in its entirety so as to form an overall impression. I then went back and looked at the pieces in order to analyse them. I identified the main issue addressed in each paragraph or section, and jotted down key words or categories in the margin. More often than not, a whole number of issues were addressed in one posting or set of communications. I then looked at these single instances in isolation and tried to draw meaning from them without necessarily looking for other similar instances.

Afterwards, I related the pieces back to the whole – back and forth from pieces and from the whole to the pieces – over and over again. As Godamer (1976) states, the movement of understanding is 'constantly from the whole to the part and back to the whole'.

This led me repeatedly to alter my understanding of the pieces and the whole. Having established patterns and themes, I looked for relationships between the identified categories. The analysis involved coding the

data into manageable themes, patterns, trends, and interactions. The data was then inspected to find associations. The observations and their interpretations were used to link the observed patterns and trends in the data to existing theoretical frameworks. After having gone through all the different sources, I then verified the main themes as they present themselves in chapter 7. After I had pulled the data apart, I attempted to put it all back together again in a more meaningful way.

The idea of *a hermeneutic circle* refers to the dialect between the understanding of the text as a whole and the interpretation of its parts, in which descriptions are guided by anticipated explanations (Gadamer 1976). As Gadamer (1976) explains:

> It is a circular relationship ... The anticipation of meaning in which the whole is envisaged becomes explicit understanding in that the parts, that are determined by the whole, themselves also determine this whole.

Merriam (1988) suggests seven analytic frameworks for the organization and presentation of case study data:

- the role of participants
- the network analysis of formal and informal exchanges among groups

- historical
- thematic
- resources
- ritual and symbolism
- critical incidents that challenge or reinforce fundamental beliefs, practices, and values

This study incorporates detailed descriptions of the case and its setting in chapter 4. In chapter 5, weekly events are summarised, thus making use of the analytic framework that deals with critical incidents. Chapters 6 and 7 are organised thematically and based on the formal and informal exchanges among the group in combination with all the different data sources identified above.

Ricoeur (1974) suggests that

> Interpretation ... is the work of thought which consists in deciphering the hidden meaning in the apparent meaning, in unfolding the levels of meaning implied in the literal meaning.

The focus of the study was not to come up with universal truths – but to decipher the hidden meaning behind the text that was analysed. In the process, transferable knowledge (instead of generalisations) evolved in terms of patterns that may be compared and contrasted with other

published literature and may inform practice in similar elearning environments.

Quality criteria

Research in the interpretive tradition is typically assessed in terms of trustworthiness criteria that include credibility, transferability, dependability and confirmability, and authenticity criteria that include fairness and ontological, catalytic and tactical authenticity (Guba & Lincoln 1996). Gephart (1999) agrees and similarly lists trustworthiness and authenticity as criteria for assessing interpretivist research.

In quantitative research, *reliability* is usually interpreted as the ability to replicate the original study using the same research instrument and thereby to obtain the same results. Qualitative research is often vulnerable to the idiosyncratic biases of the researcher and can at best be descriptive and interpretive. But there are methods of guarding against these dangers. To ensure rigour, this study will focus on the credibility, transferability, dependability, audibility, confirmability, and authenticity of the research findings.

Credibility may be described as the soundness of the research conclusions, and the production of findings that are convincing and plausible. It asks the following questions:

'Was the study done in such a way that the participant's data were accurately identified or described?' and 'How well do the findings match that which is being observed?'. Credibility therefore means determining the soundness of the study. This could be achieved, for example, by taking the research findings back to participants. A strong engagement with the case, the collection of sufficient data, active observations, member checking, and triangulation of the data sources ensured the credibility of this study (Merriam 2002; Hull 1997).

Generalisability may be defined as the extension of research findings and conclusions from a study conducted on a sample population to the population at large. Generalisability, from a rigidly positivistic point of view, is not available to teacher-researchers because teaching is not a narrowly circumscribed technical enterprise that can be carried out by identifying sets of behaviours that can be reproduced in any classroom context. Snow and Anderson (in Feagin, Orum & Sjoberg 1991) state:

> From the standpoint of conventional, positivistic social science, with its emphasis on the development of abstract laws that facilitate prediction and control, the production of generalisable findings is its most basic activity.

In this study, I preferred to seek transferability rather than generalisability. Whereas generalisability usually applies only to certain types of quantitative methods, transferability may apply in varying degrees to most types of research. Unlike generalisability, transferability does not involve broad claims. Instead, it invites readers of research to make connections between the elements of a study and their own experience.

Transferability refers to the fact that the researcher is responsible for providing comprehensive, detailed and specific descriptions in order to obtain enough information so that it can be useful to the reader (Lincoln & Guba 1985; Terre Blanche & Durrheim 1999). Detailed, rich and layered descriptions provide sufficient information to enable readers to judge the possibility of any applicability of the findings to their own settings (Seale 2002). Readers thus make the transfer by making connections between elements in the study and their own experience. Hull (1997), and James and Mulcahy (1999) add that the description must also include convincing analysis or interpretation. Transferability asks whether the findings can be applied to another setting or grouping of people who experience the same phenomenon.

I aimed to produce trustworthy and transferable results, rather than to ensure validity and reliability in the traditional sense of the words. Because I intended the results of this study to be transferable to other contexts, I have kept a detailed account of the environment that surrounded the research, and I have included a rich description of that environment in the thesis (see chapter 4). Armed with detailed information about the study itself, readers of this research can confidently transfer the findings of this study to other situations. Instead of the discovery of a universal generalisable truth, the focus is therefore on exploration and a qualitative description of the dynamics in a small group of students who participated in a module that was presented by means of a game metaphor.

Dependability is concerned with the provision of detailed descriptions of all the components of the research process, including how the research was designed, and how the data was mined and analysed. It asks the following question: 'Are the results consistent with the data collected?' The research should aim to convince the reader that the findings are indeed trustworthy. Dependability, in contrast to reliability, is that which refers to the degree to which the research is repeatable. When one uses an interpretivist research approach, it is assumed that the reality that is investigated is not constant and static. It thus cannot be expected that the same results will be found repeatedly. On the contrary, what *is* expected is that different people will change or behave differently in different contexts.

However, since this study provides detailed in-depth descriptions of not only the design, development and implementation of the module, but also of the research process, the reader will be judge for himself or herself whether the findings are in line with the material that was collected.

Audibility is related to the consistency of qualitative findings and is therefore comparable to reliability in quantitative research. Audibility asks: 'Are there a sufficient number of accounts of the data and the analysis?' This is achieved by means of an 'audit trail' that includes documentation of the methods, procedures, the decisions made, the population, and explanation of the categories that are used (Hull 1997; Merriam 2002). Audibility is thus accomplished when another researcher can follow the decision trail of the researcher. It is argued that the rigour of the study may be established if the reader is able to audit the events, influences, and actions of the researcher (Koch 1994). Although an exact replicability of findings is obviously impossible, the data sets obtained, and their interpretation by other researchers who study the same community at a similar time, should be largely comparable (James and Mulcahy 1999). This study aims to document the various components involved in as much detail as possible so that other researchers will be able to follow the trail.

Confirmability refers to neutrality and objectivity, and is a qualitative concept corresponding to the concept of objectivity in quantitative research. It refers to the degree to which research results can be confirmed by other researchers. The confirmability of findings is based on the researcher's critical self-reflection with regard to his/her assumptions, worldviews, biases, theoretical orientations, values, and epistemological stances (Merriam 2002). Confirmability occurs when credibility, transferability, and audibility have been established.

A limitation to the observational method of inquiry is the effect that the researcher's presence during the event, and/or personal biases, may have on the recording and analysis of the online learning experience. The personal integrity, sensitivity, and possible prejudices and biases of the researcher needed to be taken into consideration in this study. The possibility that personal biases could have crept into how the research was conducted, into the selection of the alternative research methods used, and into the preparation of surveys and questionnaires was always there. Even though multiple types of triangulation were used in this study, my closeness to the *CyberSurfiver* module, in terms of fulfilling the multiple roles of designer, developer, facilitator and researcher, made it extremely difficult for me to identify and exclude all my assumed personal biases. I cannot therefore claim to have been totally

impartial at all times (even if that were humanly possible) because I could not detach my findings from my own personal assumptions. But in spite of this, all possible measures have been taken to ensure that the research findings are nonetheless confirmable. Thus, for example, the fact that this study used a team of observers to do carry out the observations, guarded against the more obvious symptoms of bias. The members of the team compared and crosschecked their findings in regular sessions with one another. This practice made it possible to evaluate in consultation with others, to confirm data, and therefore to satisfy one of the most critical requirements of social science research.

Authenticity acknowledges that research findings represent *an impermanent agreement* about what is considered to be true. Researchers should demonstrate that they have fairly represented a range of different realities, and help the reader to develop a more sophisticated understanding of the case being studied an appreciation of the viewpoints of others (Seale 2002). Member-checking, peer review, and respondent analysis, enhanced the authenticity of this study.

Atkinson, in Altheide and Johnson (1998), argues that there is no *perfect* theoretical or epistemological foundation, no *perfect* method for data collection, and no *perfect* or

totally transparent modes of representation. But all of the qualities of rigorous research can be incorporated in a case study if one combines all of the strategies that enhance the trustworthiness of the study.

Crystallisation and triangulation

Historically, triangulation as a method of validation has been discussed as an important part of the research design process (Janesick 2000). More recently, however, scholars such as Richardson (1994) and Janesick (2000) refer instead to 'crystallisation' as the illuminating and clarifying lens through which qualitative research designs and their components should be viewed. According to Richardson (1994), crystallisation recognises the many possible facets of any given approach to the social world. She explains the triangle of triangulation by using the metaphor of a crystal, and states that the crystal

> combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach. Crystals grow, change, and alter, but are not amorphous (Richardson 1994).

Denzin and Lincoln (2000) assert that crystals are prisms that reflect and refract, creating

ever-changing images and pictures of reality, and she deconstructs the traditional concept of validity on the grounds that there is no single triangulated truth.

In this study, triangulation is considered to be a process that uses multiple perceptions to clarify meanings and to verify the repeatability of an observation or interpretation (Stake, 2000). Triangulation served the purpose of reducing the likelihood of misinterpretations and of clarifying the meaning – even though it is acknowledged that no single truth or unquestionable certainty may be found.

A single complex intervention such as *CyberSurfiver* ran over a period of six weeks and involved hundreds of discrete designer, facilitator and researcher decisions in an attempt to promote innovative practice. It is thus difficult to decipher direct causality. The dependability of the findings can be promoted by means of triangulation from multiple data sources and a repetition of analysis across cycles of performance.

The strategy of triangulation permits the researcher to assemble complementary and overlapping measures of the same phenomena. The observers in a case study usually have a variety of data sources at their disposal. These sources can be called upon to assess the nature of particular events. Sources may include diaries, personal interviews, and correspondence. All of these

are utilised to crosscheck and validate observations. Denzin (1989) calls this 'the triangulation of sources'. Stake (1995) argues that the protocols that are used to ensure accuracy and alternative explanations are called triangulation.

Case studies are regarded as a triangulated research strategy. The need for triangulation arises from the ethical need to confirm the soundness of the processes. This can be achieved in case studies by using multiple sources of data (Yin 1984). Snow and Anderson, in Feagin, Orum and Sjoberg (1991), assert that triangulation could occur with data, investigators, theories, and even methodologies.

Denzin (1984) identified four types of triangulation. They are:

- *data source triangulation.* This happens when the researcher expects data to remain the same in different contexts involving time, spaces and people.
- *investigator triangulation.* This happens when multiple, rather than single observers examine the same phenomenon.
- *theory triangulation.* This happens when investigators with different viewpoints and more than one theoretical scheme interpret the same results.

- *methodological triangulation.* This happens when one approach is followed by another investigator so as to increase confidence in the interpretation.

The argument is that social reality is too complex and multifaceted to be adequately grasped by any single method, source, or investigator. Rather than debate the merits of one against the other, triangulation allows a combination of multiple strategies to complement and supplement each other's weaknesses.

In *CyberSurfiver*, multiple triangulations were thus established when I brought together, in one investigation, multiple observers, theoretical perspectives, sources of data, and methodologies. In combining these, I tried to overcome the weaknesses or intrinsic biases and the problems that come from single method, single-observer, and single-theory studies. Case studies need to provide multiple perspectives and to allow readers judge and construct their own reality (Stake 1995). In *CyberSurfiver*, the analysis was triangulated in terms of methodologies, theories, observers, and data sources (Silverman 1996; Stake 1995).

Although qualitative research has been criticised for lacking rigour in terms of the standards of quantitative research, rigour is not attainable by means of quantification. In

the same way, quantitative research is not synonymous with impartiality and qualitative research is not synonymous with bias and prejudice. Both research approaches have implicit within them varying degrees of subjectivity because both are influenced by *human* decisions. Each method must be judged against the standard of what it claims to accomplish (Hemingway 2001).

Closure

The purpose of this chapter was to present and discuss the research design that was used to address the questions that guide this study. The chapter started out by highlighting the qualitative interpretivist paradigm in which the study took place. In the process, it touched on the design of the *CyberSurfiver* module, design experiments and the ADDIE instructional systems design model. The chapter then highlighted the design of the research study, the case study as the selection of what is to be studied and as a research method, and the influences exerted by ethnographical and hermeneutical approaches in the research. In addition, the data collection methods and mode of analysis were discussed. The chapter concluded by showing how trustworthiness and authenticity were used as quality criteria.

The researcher will describe the details of the case study on which this research is based in

chapter 4 in answer to the first sub-question
which is:

> *How can a web-based module be*
> *designed so that it closely resembles*
> *the game structure of the Survivor©*
> *reality show?*