Introduction

If educational practitioners wish to ensure that education will be intrinsically engaging and satisfying, they need to think carefully about the learning process. Why do adults engage in learning? Are there enough motivators to ensure that people will want to learn in depth? How can opportunities for interaction be designed so that they support learning goals?

This study examines the interaction that took place in an adult online learning community as a result of the introduction of a metaphor of a well-known television reality game. It investigates the dynamics between the learners who were involved in the module, and explores the group dynamics that arose out of the application of the *Survivor*© metaphor as a means to teach this module.

This chapter will review the literature that deals with play theory and other play and game-related issues, and will touch on adults' expectations of the learning environment and the role that motivation plays in the learning process. We will then look in more detail at some aspects of group formation. Finally, the chapter will conclude by providing the conceptual framework that grounded the study, through both the design and research phases. This section will focus on the role of the various types of interaction that underlies the dynamics of this online course.

The element of *play* in learning

Until quite recently, most educators defined learning exclusively as something that happens within a defined space and time, and that depends decisively on printed or written materials and the delivery of a lecture or oral teaching presentation by one person to a largely passive and often indifferent audience. In the last decade or so, the proliferation and development of the technology that characterises the 'information era' has undermined the largely unchallenged authority and prestige of traditional definitions of teaching and learning that have prevailed for so many centuries. Today, the availability at ever-more reasonable prices of a variety of electronic media have potentially liberated teaching and learning from the constraints of space and synchronicity and have stimulated among practitioners a new drive to adapt teaching practices to the potential of these new virtual learning environments. In spite of these developments, very little attention overall has been given to the impact of *creativity* and *enjoyment* on the learning process – two factors that may indeed generate intrinsic motivation in those in whom it was either weak or altogether absent (Karaliotas 1999). While intrinsic motivation will keep some learners working on specific tasks (no matter how dreary and poorly presented), many do not possess the natural curiosity, drive, vision, or interest that

one needs to succeed in a traditional learning environment.

Over the past two decades, electronic games have become an ubiquitous part of the suburban scene in many affluent societies, especially among younger people. While the obsession of the young with these games initially alarmed both parents and educators alike, some far-sighted educational researchers soon began to wonder whether this intense motivation to play could be tapped and harnessed for educational purposes (Malone 1981).

Whilst some educationists such as Moore (n.d.) argue that fun, games and humour can sugar-coat learning and make regular instruction seem dull, others like Garris *et al.* (2002) reason that games and play can help to focus a student's attention on content and can intensify a student's positive affects. Lepper and Malone (1987) also discuss the effects of adding game features to educational situations from the points of view of two perspectives. They argue that from one perspective the addition of games may be distracting and therefore decrease learning. While they agree that adding game elements may increase learner motivation in the short term, they argue that game elements may, in the longer term, cause learners to experience other more traditional ways of learning as boring – thereby decreasing interest in such forms of learning. Cordova (1993) also notes that the opponents of using computer games in education indicate that such activities may distract learners from educational content and thus vitiate the learning process.

The other perspective emphasises that motivational game-like features may increase learners' attention and ultimately enhance learning (Malone & Lepper 1987). Garris *et al.* (2002) support this viewpoint and report that incorporating game features in the learning process increased motivation and consequently enhanced attention and retention. Cordova (1993) states that the introduction of games enhances learning because it increases learner's enjoyment, attention, effort, and concentration. Chen *et al.* (1998) also report on the positive effects of computer-based educational games on motivation and learning.

Lifelong learning is an ideal to which progressive governments have committed themselves in their educational policies and planning (MEXT 1990; Paye 1995; eEducation Draft White Paper 2003). In spite of this, learning opportunities that include elements such as problem solving, critical thinking, and creativity are few in number. To make lifelong learning a viable option, the presentation of learning should be characterised by certain invariable features, one of which is that learning should (wherever possible) be made a *pleasurable* activity (Kinzie 1990).

The play attribute

In societies in which a strong work ethic prevails, the worth of individuals is usually predicated on the activity they engage in to produce an income. In such societies people feel worthless if they are not constantly busy with something that is seen as 'productive' in this narrow sense. In terms of the kind of Puritan theology that is still widely influential (if only implicitly) even today in the affluent Western counties of the world, work is *blessed* because by keeping people busy, it draws their attention away from *evil thoughts or pursuits* such as *worldly joys* and *pleasures* that may be *sinful* (Karaliotas 1999).

These ingrained modes of thinking have effected a separation between work and play, with fun or enjoyment, representing purposelessness, characterised as something that should only be indulged in at specific times, in measured ways, and on special occasions. Fun and playfulness are often ruthlessly repressed in working environments, as may be seen in those computer games that enable the user to hide the game from the boss. This essentially artificial separation between work and play has had a profound effect on traditional learning theories and educational design. Play and games are often assigned a role that is secondary to 'real' work. Some educational theories and practices indeed assert that learning *is* essentially a non-playful process because learners have to accept that gaining knowledge can only be the result of hard work (i.e. suffering, boredom and alienation). This widespread but implicit belief severely limits the possibility of research into the phenomenon of play as a means of making learning more effective and less arduous in every way.

Play is both natural and instinctive (Huizenga 1929). In the literature, the heritage on play is often traced back to William James's (1890) textbook classic, *The Principles of Psychology*. James (1983) considered play to be a human instinct:

> Instinct is usually defined as the faculty of acting, to produce certain ends, without foresight of the ends, and without previous education in the performance... [Instincts] are the functional correlatives of structure.

Play is a natural phenomenon in humans. Kerr and Apter (1991) confirm this:

> Play is not a special and unusual psychology phenomena. It is, in healthy people, ... normal, regular and frequently occurring.

Huizenga (1929) states:

> Nature, so our reasoning mind tells us, could just as easily have given her children all those useful functions

> of discharging superabundant energy, of relaxing after exertion, of training for the demands of life, of compensating for unfulfilled longings, etc., in the form of purely mechanical exercises and reactions. But no, she gave us play, with its tension, its mirth and its fun ... the fun of playing resists all analysis, all logical interpretation ... Here we have to do with an absolutely primary category of life, familiar to everybody at a glance right down to the animal level ... Animals play, so they must be more than merely mechanical things. We play and know that we play, so we must be more than merely rational beings, for play is irrational.

Play is a basic part of the behaviour of most mammals, including people. Although play is easy to recognize, it is difficult to define. It covers a heterogeneous assortment of activities from the sudden pounce and attack efforts of a kitten, to the highly ritualised games of adult human beings.

According to Huizinga (1950), a cultural historian and influential modern play theorist, play can be defined as: free, outside of ordinary life, not serious, of no material interest, not for profit, and absorbing. He depicts play as a voluntary activity indulged for its own sake, and although it may be creative, he regards it as being unproductive and non-utilitarian. Huizinga describes play as having boundaries of space and time because while it lasts it takes place outside those events that most people would call *ordinary* or *normal life*. Play operates according to its own course and meaning and is regulated by arbitrary and conditional rules and conventions which are integral to the uncertainty of play.

Huizinga titled his book about play *Homo Ludens: A Study of the Play Element in Culture*. The term *Homo Ludens* means *Man the Player*, which contrasts with the descriptor that palaeontologists have assigned human beings: *Homo Sapiens*, or *Man, the Thinker*. Huizinga's ascription emphasises the priority that he has assigned to the element of play in society.

Huizinga also believed that play (or *agon*, competition) has the power to push a person beyond mediocrity. As people compete for first place, they simultaneously force themselves to improve their skills and so they reach beyond themselves and achieve a degree of educational success that is beyond their self-assigned mediocrity.

From contests such as those that were a prominent part of everyday life in ancient Greece, we have imbibed values and attitudes that even today form the bedrock of civilised living. These values are implicit in the *CyberSurfiver* design. They include:

- playing by the rules
- respecting the rights of others
- appreciating the results of team or individual effort.

According to the social scientist, Caillois (1986), play is an activity that is separate, uncertain, unproductive, fictitious, and organised. He also called it an occasion of pure waste: waste of time, energy, ingenuity, skill, and often of money. He defines play as a free and voluntary activity that occurs in a special space protected from the rest of life, and as being an activity that has no certain outcomes. While the *CyberSurfiver* game was uncertain in its outcome (it was not known, for example, who the sole *CyberSurfiver* would eventually be), the module was certainly not unproductive nor did the learners experience it as 'fictitious'. One of the learners in the module commented that she experienced *CyberSurfiver* as anything but a game because of the pressure of hard work and challenges such as limited time and the problems associated with the technology.

Caillois (1986) furthermore groups play into various categories, from the *unstructured* to the *highly disciplined*, and distinguishes four main types of games. According to Caillois (1986), these types include games

- in which competition (*agon*) or conflict dominates (as, for example, in matches and racing games)
- where chance (*alea*) or luck is dominant, such as in *Snakes and Ladders*
- of simulation and mimicry, such as we see, for instance, in children's make-believe play
- in which dizziness or vertigo (*ilinx*) are stimulated – such as when we ride on roller coasters or whirl around for a long time

CyberSurfiver would probably be categorised as a *simulation* because the *CyberSurfiver* metaphor involved some role playing.

Krasnor and Pepler (1980) contend that play is flexible, that is has a positive affect, that it is intrinsically motivating and is not literal, whereas Bejarano (1998) described play as a

> space of uncertainty, difficulty and of challenge and creativity, that invites participation in the collective construction of alternatives. Those who enter play find a world of autonomy, decision and risk. To survive in play it is necessary to make use of our life experience and knowledge, and resort to instinct and perspicacity and the moment of inquiry and the search.

Numerous other sources aim to define the meaning of play and list the various

characteristics that are associated with play. The table below is simply an indication of the various characteristics attributed to play in the literature.

Table 4: Characteristics of play

Characteristics of play	Author(s)
• intensive • purposeful • goal oriented • optimal life experience • satisfying • rewarding • clear goals	Rieber & Matzko (2001)
• the game itself has intrinsic worth • learners are in control • the game stimulates a sense of competence • learners work under the impetus of 'optimal challenge' • an activity in and of itself that is enjoyable	Perkins (1986)
• inherently unproductive	Garvey (1990)
• lacks extrinsic goals • intrinsically rewarding • fantasy and imagination superimpose on reality	Diamond (1996)
• it carries an emotional element of pleasure • it is characteristic of the immature rather than of the adult • it differs from non-playful responses in having no immediate biological result	Beach (1945)
• an appetitive activity in a relaxed field	Bally (1945)
• an outlet for surplus energy	Spencer (1855)
• offers many choices	Juul (2003)

Characteristics of play	Author(s)
• free (not obligatory) • separate (isolated in space and time) • uncertain (indeterminable) • unproductive (without material production) • governed by rules (contingent conventions) • a form of make-believe (suspension of disbelief)	Caillois (2001)
• to-and-fro movement of collective play	Godamer (1989)

Walther (2003) claims that there are important ontological and epistemological differences between playing and gaming. He asks the following questions: What is play? What is a game? He then describes play as an open-ended territory in which make-believe and world-building are crucial activities. Games are confined areas that challenge the interpretation, optimising of rules and tactics, time, and space.

Play and flow

Play, fun and games are often dismissed as being the frivolous opposite of work: something that children do, not adults. It is erroneous and limiting to define playfulness in this way because there are learners who find pleasure in learning for its own sake and not because of any external rewards – and they are often highly motivated to succeed. If one disparages play with negative epithets such as 'childish' and 'trivial', one denies the intrinsic worth of *flow* which is intrinsic to play.

Csikszentmihalyi, a professor and former chairperson of the Department of Psychology at the University of Chicago in the United States of America, is the father of the concept of flow. Csikszentmihalyi (1990) asks the following questions: What is fun? What makes some experiences enjoyable while other experiences are not? In his work over a period of many years, he has looked at that the factors that make people truly happy, satisfied and fulfilled. In the course of his research into such people, he coined the term 'flow' because many of the people whom he observed encapsulated their experience in this word. In his book, *Beyond Boredom and Anxiety,* Csikszentmihalyi (1975) describes the flow experience as

> one of complete involvement of the actor with his activity ... He has identified a number of elements that

> are indicators of its occurrence and intensity. These indicators include: the perception that personal skills and the challenges provided by an activity are imbalance, centering of attention, loss of self-consciousness, unambiguous feedback to a person's actions, feelings of control over actions and environment, and momentary loss of anxiety and constraint, and enjoyment or pleasure.

Csikszentmihalyi (1990) further states that flow is the holistic sensation that people feel when they act with total involvement.

> The state in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it.

Bakker (2004) describes flow as a short-term peak experience that is characterized by absorption, enjoyment, and intrinsic motivation. Lutz and Guiry (1994) defined flow as a state of mind sometimes experienced by

> people who are deeply involved in some event, object, or activity ... They are completely and totally immersed in it ... Indeed, time may seem to stand still and nothing else seems to mater while [they are] engaged in the consumption event.

Csikszentmihalyi (1990) describes absorption in employees as a state of total concentration in which they are totally immersed in their work. Time flies and they forget everything around them. Csikszentmihalyi (1977) also notes that when in the flow state

> players shift into a common mode of experience when they become absorbed in their activity. This mode is characterized by a narrowing of the focus of awareness, so that irrelevant perceptions and thoughts are filtered out; by loss of self-consciousness; by a responsiveness to clear goals and unambiguous feedback; and by a sense of control over the environment ... It is this common flow experience that people adduce as the main reason for performing the activity.

According to Csikszentmihalyi and Csikszentmihalyi (1988), the flow experience begins only when challenges and skills are in balance and of a certain quality. When both challenges and skills of this kind are numerous, the person is not only enjoying the moment, but is also stretching his or her capabilities by (possibly) learning new skills and increasing self-esteem and personal complexity. This process of optimal experience he describes as *flow* (Csikszentmihalyi & LeFevre 1989).

Ghani, Supnick and Rooney (1991) note that a sense of control over one's environment is one of the key characteristics of flow. Csikszentmihalyi (2002) explained, however, that it is actually

> not so much the 'feeling' of control, as the fact that you can act without thinking, without interruption, and [by] making your own choices (for example, BEING in control). If a computer program has a mind of its own, is not responsive to your commands, or is so slow as to appear to be a moron, then you are again brought back to 'reality' and lose flow.

Ghani, Supnick and Rooney (1991) also emphasise the fact that flow always creates a balance between the perceived challenge and the level of skill required to accomplish the task. They state that flow is

> total concentration in an activity and the enjoyment which one derives from an activity ... The precondition for flow is a balance between the challenges perceived in a given situation and skills a person brings to it.

Trevino and Webster (1992) suggest that involvement in a playful, exploratory experience is self-motivating because it is pleasurable and because it encourages repetition. Flow is a continuous variable that ranges between *none* and *intense*. In the online environment, flow represents the extent to which

- the user perceives a sense of control over the computer interaction
- the user perceives that his or her attention is focused on the interaction
- the user's curiosity is aroused during the interaction
- the user loses self-consciousness
- the user experiences a feeling of total engagement
- the user finds the interaction intrinsically interesting

This discussion makes it clear that the activity of playing games in the learning environment has the potential to increase motivation.

Games as educational tools

If one considers that Nintendo's Super Mario Bros.3 has made US$500 million worldwide (according to Nintendo of Denmark, quoted in Smith 2003), one can see that that the game industry is growing fast and may well generate more income than other kinds of media in the future (Smith 2003). One research project on the media used by six to nine-year-old Europeans revealed that 79% of boys and 48% of girls play computer games (Smith 2003). It is therefore understandable

that a lot of attention has been given to the relationship between information technology, playing, and learning over the last couple of years. Slogans such as *Play-and-learn* and *Learn-while-you-play* are typically found in advertisements that promote the use of software packages whose purpose is to integrate a game with learning. However, the design and production of such games are rarely based on any kind of research that has evaluated their potential for learning. Malone (1980) states that the characteristics that make games *fun* do not necessarily make them *educational*.

Not long after the birth of computer games, the first hopes for the potential of learning through games were expressed. Experts hoped that the enthusiasm so obviously generated by playing games could be harnessed in the cause of sound learning. Since then, several commercial games that have met with varying degrees of success have been labelled *edutainment* – a neologism derived from combining the words 'education' and 'entertainment'.

Despite the large industry that produces edutainment for children, commercial games seem to ignore the potential of games for learning. As they are drawing upon a combination of creativity, analysis and their knowledge of other games, game players usually interact with, and explore, systems that are quite complex. Because of this, games do not typically deliver knowledge in a form that is easily measured or evaluated by fixed standards.

A good game offers a series of interesting choices (Meier, in Juul 2003). This characteristic of successful games has commonly been quoted as the first rule for those who want to create good games. Choice appears to be a primary feature of successful games such as *Donkey Kong* and *Tic-tac-toe*. While other games such as *Dance Dance Revolution* do not offer the player interesting choices, tapping the dance mat in a rhythm that harmonises with the music creates enjoyment. This proves that a series of interesting choices is not all there is to a successful game.

The point is that there is no *single* description that explains what makes games attractive. Educators are often challenged to add that special 'something' to the learning environment so that learners will become as engaged in their learning as they seem to be when they are playing games.

Some of the advantages that accrue to people who play games are the development of skills such as level-headedness, analysis, and the ability to understand and to interact with rapidly changing environments (González *et al.* 2001; Game Research Newsletter 2002; Grossman & Minow 2003). The main potential of games,

according to their advocates, lies in the ability of games to increase motivation because of their *interactive* nature and because they place the player in control of the 'learning'. It seems though that most edutainment games have problems in living up to these ideals.

Research shows that edutainment games tend to appropriate control (a crucial factor, as I noted above), and that they narrow the scope of the game universe so that it fits in with the intentions of the educator and the producer of the game (Liestol, in Smith 2003). Most edutainment games do not permit the player to choose his or her own path through the game.

The intention of games is often to convey some specific information about a topic. Limiting the game universe and conveying specific information does not conform well to traditional game dynamics, where simple and general rules, such as exploration and user freedom, are indispensable. And so educators have turned their attention to the adventure genre in which it is easier to focus on information. But even here, they have found, it is difficult to impart the depth that is necessary in an educational topic. In addition, very few studies have delivered hard evidence that games can be used for learning, and especially adults learning. Typically, research has been directed towards the best methods of embedding information in games – the assumption being that this information will somehow be experienced by the player as a covert form of learning.

Because many educators focus mainly on the delivery of information, they overlook the fact that games are often a social activity, even when they are being played in front of a single computer. Many people prefer to explore games in the company of others, and it is often this particular social relationship that creates the dynamics that support the learning process (Game Research Newsletter 2002). By playing together, people supplement the skills of others and typically correct each other's mistakes. The Interactive Digital Software Association (Burke 2000), a trade group representing computer game publishers, released survey results that show that

> an overwhelming percentage of computer and video game players play with friends and family, confirming the view that interactive entertainment brings people together and burying the myth that games are not a social activity.

What makes computer games so appealing? Academics are often called upon to provide authoritative answers to questions such as the one posed above, but while we may frame and carry out research that might eventually provide an authoritative answers, we have to

face the fact that many of these questions cannot be answered in a facile and straightforward manner.

This research study did not set out to create or investigate a digital game where the content that needed to be mastered and in which the outcomes that had to be reached were somehow concealed within the game, waiting to be exposed and internalised by learners as they had *'fun'*. The aim was specifically to use a carefully devised metaphor of the *Survivor*© game to create a dynamic learning environment that would support the learning activities that had to take place.

Adult learners

'Pedagogy' is derived from the Greek words 'παιδί', meaning 'child' and 'αγωγός', meaning 'leader of'. Pedagogy thus literally means the art and science of teaching children. Traditionally, education was often based on assumptions about teaching and learning that evolved between the 7th and 12th centuries in the monastic and cathedral schools of Europe out of their experience of teaching basic skills to young boys. Secular schools were an invention of later centuries in Europe, and public schools were prominent in the nineteenth century. Since many teachers had been exposed to this style of teaching when they were still learning, they simply perpetuated the only model they knew. Because of this, many of the principles and practices of juvenile education were inappropriately applied to adult learners.

The education of adults began long before the 7th century when the formal practice of teaching of children started. Because adult education has been a concern of the human race for a very long time, it is odd that so little has been written about it throughout the ages. The great teachers of all times and in all cultures such as Confucius, Lao Tse, Jesus, Aristotle, Socrates, and Plato, were all principally teachers of adults. Because they suited their methods of teaching to adult learners, they all had a very different concept of teaching and learning from those that are typical of pedagogy. All of them regarded learning as a process of active inquiry rather than the passive reception of transmitted content. It was only after the end of World War I that a growing body of accepted wisdom about the unique characteristics of adults as learners began to emerge.

Many studies over the past couple of decades have shown that play is a conspicuous component of the behaviour of young, developing animals. In spite of this, it is also an important (though less obvious) constituent of adult behaviour (Caro & Martin 1985; Frasca 1999). Some research studies explicitly affirm the importance of adult play (Fagin 1981; Smith 1984). I disagree with the

assertion that play is a more important part of the lives of the immature because adults exhibit just as much interest in the enjoyment of games, even though their gaming preferences are different from those of children in both substance and style. An interest in both play and game activities continues throughout adult life, though in different proportions and in different forms (Piaget 1951).

An effective online facilitator requires a sensitive understanding of how adults learn best. Adults have special needs and requirements as learners that are different from those that are appropriate for children and teenagers. In my opinion there are three important educational theorists that have contributed to the theories of adult learning. They are Malcolm Knowles, Carl Rogers, and Cross. Each has exerted a significant influence in the field of adult learning.

Malcolm Knowles was the first to use the term *andragogy*, to describe adult learning, and clearly to theorize how adults learn. According to him (1990), andragogy is used to refer to 'any intentional and professionally guided activity that aims at a change in adult persons'.

Knowles and Knowles (1959) makes the following statements:

- Adults have a need to know why they should learn, and what they want to learn.
- A wealth of learning and life experiences can assist the adult learners to acquire the new knowledge.

Knowles (1990) provides four definitions for the term 'adult', namely a biological, legal, social, and psychological definition. For Knowles and Knowles (1959), andragogy is predicated on at least four crucial assumptions about the characteristics of adult learners that are different from the assumptions about child learners on which traditional pedagogy is premised. A fifth he added later. These assumptions are as follows.

- Self-concept. As a person matures, his/her self-concept changes from *dependent personality* to *self-directed human being*.
- Experience. As a person matures, he/she accumulates a growing reservoir of experience that becomes an increasingly powerful resource for learning.
- Readiness to learn. As a person matures, his/her readiness to learn becomes increasingly oriented towards the developmental tasks of his or her social roles.
- Orientation to learning. As a person matures, his/her attitude towards the implementation of time schedules changes from one that envisages a

possible postponement of the application of knowledge to one that requires the immediate application of knowledge. His/her orientation toward learning also shifts accordingly from one of subject-centeredness to one of problem-centeredness.

- Motivation to learn. As a person matures, his/her motivation to learn becomes internal or inner-directed (Knowles 1984).

In the *CyberSurfiver* study, the adult learners were distinguished from the others on the basis of their levels of intellectual maturity, self-directedness and intrinsic motivation, as well as their willingness to accept responsibility for their own learning. The learners doing the module all brought with them a wealth of experience that had the potential to become a group resource.

Knowles (1990) furthermore bases his andragogical model on several assumptions that are different from those of a pedagogical model. These assumptions are:

- The need to know. Adults need to understand why they need to learn something before they will show a willingness to undertake the learning. According to Tough (1979), adults that undertake to learn something on their own, will invest considerable energy in probing the benefits that they hope to gain from learning it and the negative consequences to themselves of not learning it. Learners therefore need to be aware of the *need to know*.
- The learner's self-concept. Adults have a self-concept that tells them they are responsible for their own decisions. Once they are in an adult learning environment, they often regress into the roles they became accustomed to when they were in school. Adult learners who are patently and obviously self-directing in every other department of their lives, habitually expect to be taught in the traditional manner they knew in school from the moment they enter an educational situation. They tend to resent and resist facilitators who try to free them from their regressed juvenile dependency on magisterial teachers. This of course conflicts with their subconscious psychological need to be self-directing. Teachers therefore need to help adult learners to make the transition from being dependent learners to being self-directing learners.
- The role of the learner's experience. Adults possess a great storehouse of experiences that they have accumulated over the years and – whether they have benefited from their experiences or not – they have this valuable residuum which they can use as a resource to enrich their learning processes. The young have simply not

had the time in which to accumulate so many life experiences. Adults therefore bring a different quality of mind to learning new things. This means that, in any group of adult learners, a teacher is faced with a wide range of individual differences that have to be taken into account. Differences in the experiences of adults have several consequences for adult education:

- Adult learner groups tend to be more heterogeneous in respect of background, motivation, needs, interests, and goals. Because of this, learning opportunities need to be individualised. There is thus a great emphasis on individualisation in adult education.
- The richest resource for learning often resides in the adult learners themselves. As such, there is a great emphasis in adult learning on techniques that tap in to the experience of the learners, such as group discussions, simulations, and problem-solving methods.
- Adult learners have established mental habits, biases, and presuppositions. These habits often cause them to close their minds to new ideas, fresh perceptions, and alternative ways of thinking. The challenge for educators of adults arises out of their obligation to help adults to examine their own habits and biases, and to open their minds to new approaches.

In designing the *CyberSurfiver* module, the above-mentioned differences were consciously added and accommodated. For example, learners were exposed to the test functionality in WebCT prior to the actual test by means of a Immunity Challenge. They were told why they needed the exposure, and the underlying reasons for doing an online test was explained and discussed at length in the week before the actual test had to be taken. The design made allowance for high levels of diversity, and challenged learners to break away from traditional ways of thinking and to explore the web's potential for learning in a non-traditional manner.

Knowles's theories have formed the basis of much current adult learning theory. Carl Rogers (in Rogers & Freiberg 1993), another educational pioneer, distinguished between two types of learning: cognitive (meaningless) and experiential (significant). Rogers feels that all human beings have a natural inclination to

learn and the role of a facilitator is to encourage such learning. Rogers also emphasizes the importance of learning how to learn, and being open to change. He links a number of factors such as interest, low-threat, and self-initiation to successful adult education. According to Rogers (in Rogers & Freiberg 1993), the role of the teacher is to facilitate experiential learning by:

- setting a positive climate for learning
- clarifying the purposes of the learner(s)
- organizing learning resources and making them available
- balancing the intellectual and emotional components of learning
- sharing feelings and thoughts with learners while being careful not to dominate them or dictate to them

In a more recent theory, Cross (1981) developed the Characteristics of Adults as Learners (CAL) model. The CAL model consists of two characteristics (personal and situational) and attempts to integrate other theoretical frameworks for adult learning such as andragogy (Knowles), experiential learning (Rogers), and lifespan psychology.

In her study on laboratory safety training, Debbie Decker (2002) calls adult learners the *what's-in-it-for-me* learners. She maintains that adults learn best by doing, and retain more information when they actively participate in the learning process. If adult learning is to be effective, the adult learning situation should be interactive by nature and adult learners should be prompted to take an active part in their own education. This implies that facilitators of adult learners should design their teaching and learning activities in accordance with these assumptions, and should encourage learners to take an active role in their own education. Playing games as an instructional method is one of the methods that has proven to be successful.

Table 5 shows some of the studies that have investigated the characteristics and principles of adult learning. Later in this thesis, the way in which adult learning principles manifest in the *CyberSurfiver* case study will be contrasted with the main body of research on adult learning. It is important to note that I will not make the distinction between an adult learner and a pre-adult learner by using *age* alone as the criterion. In this study, intellectual maturity, rather than age, will determine the use of the concept of adult learning.

Table 5: Characteristics of adult learning

Characteristics of adult learning	Author
Adult learners • are autonomous and self-directed • have a foundation of life experience and knowledge • are goal oriented • are relevancy-oriented • are practical • need to be shown respect	Lieb (1991)
Adult learners have • a self-concept that tends towards self-direction • a growing reservoir of experience • a developmental readiness to learn • a problem-centred and present-reality orientation to learning.	Knowles (1984)
Key factors in adult learning are that adults • need to know why they need to learn something. • need to learn experientially • approach learning as problem-solving • learn best when the topic is of immediate value	Knowles (1984)
Adult learning is based on • voluntary participation and mutual respect among participants • collaborative facilitation • a praxis approach to teaching and learning • the necessity of critical reflection on life as a whole • the pro-active and self-directed empowerment of participants	Brookfield (1986)
Adults prefer learning situations that • are practical and problem-centred • promote their positive self-esteem • integrate new ideas with existing knowledge • show respect for the individual learner • capitalize on their experience • allow choice and self-direction	Goodlad (1984)
Adult learners	Decker (2002)

Characteristics of adult learning	Author
• possess a wealth of prior knowledge and experience • appreciate clear goals and objectives • do not want to be surprised or embarrassed in front of their peers. • need good feedback • require material that is relevant • need to take an active part in their own education	
Some principles of adult learning include the fact that • new knowledge has to be integrated with previous knowledge and that this process requires active learner participation • collaborative modes of teaching and learning enhance the self-concepts of those involved and should result in more meaningful and effective learning • adult learning is facilitated when teaching activities promote the asking and answering of questions, problem finding, and problem solving • adult skill learning is facilitated when individual learners can assess their own skills and strategies in order to discover their own inadequacies or limitations for themselves	Dewar (1996)
Key assumptions about adult learners are that • adults are motivated to learn as their needs are progressively satisfied by learning • their orientation to learning is life-centred • adults rely on experience as a rich resource • adults have a profound need to be self-directing • that they enjoy processes of cooperative and democratic inquiry rather than being made to conform to quasi-authoritative canons of received 'wisdom' • adults are all individuals and adult education should therefore make provision for differences in style, time, place, and pace of learning	Lindeman (1926)

Even though *andragogy* is often used in the literature to define only adult learning, it also suggests a learner-focused approach to education that is equally relevant to both adults and children. The essential differences are that it is important in an adult learning

environment (1) to explain to learners why something is important for them, (2) to show learners how they can integrate the content with their prior experience, and (3) how the information can be assimilated and understood. Furthermore, adult learners will not learn until they are ready and motivated to do so. This often requires the teacher to help them to overcome their inhibitions and rise above the traumatic effects of past experiences that have been imprinted by early learning experiences, and so to change their attitudes and beliefs about learning.

Motivating adults to learn

Studies that examine the various motivational aspects of computer-based games abound. They include Maslow's Hierarchy of Needs 1954; Keller's ARCS Model 1979; Eccles's Model of Achievement and Activity 1983; McClelland's Social Motives 1985; Weiner's Attribution Theory 1986; Malone and Lepper's Taxonomy of Intrinsic Motivations for Learning 1987; and Csikszentmihalyi's Flow Theory 1990.

Because I wanted to take into account the unique qualities of various motivational styles, I set out to identify those essential elements that would actively stimulate learning in the adult learners who would participate in *CyberSurfiver*. After scanning the literature that dealt with motivational styles, I decided to base my design on the ideas of Maslow (1954), Keller (1979), and Malone and Lepper (1987), and to a limited extent on Herzberg (1959), O.Houle (1988) and Lieb (1991).

This study will focus on these theoretical foundations of motivation that I have chosen to discuss because of their importance and relevance to understanding and interpreting the events and interactions that took place in the *CyberSurfiver* module. I will begin with Maslow's classic motivation model, and link these theories of motivation to the adult learning process.

Maslow's Hierarchy of Needs

Abraham Maslow is well known for his motivational model that is based on a hierarchy of needs. He maintains that human beings are motivated by unsatisfied needs, and that certain lower needs need to be satisfied before higher needs can be satisfied. Maslow (1954) identified the following five needs as part of his model: physiological needs, safety needs, love needs, esteem needs, and self-actualisation needs.

Physiological (body) needs

Physiological needs are those basic needs such as the need for air, warmth, food, water, sleep, stimulation, sex, activity, protein, salt, sugar, calcium, and other minerals and vitamins. These bodily needs are biological.

When these needs are not satisfied we may experience sickness, irritation, pain and discomfort. Biological needs are very basic because if the human body is deprived of essential nutrition and hydration for a long enough period, the body will die. Our physiological reactions to deprivation motivate us to supply the body with what it needs so that it can re-establish a relatively stable state of equilibrium as quickly as possible. Only once these needs have been attended to can a person be able to concentrate on other things. An appreciation that this is the most basic level of human need is important for our exploration of the dynamics of the *CyberSurfiver* module. For example, at one stage, a learner complained that he only had a couple of hundred rand left until the end of the month and that he had to sustain an entire family on that amount. His fear was that he would not be able to provide for the basic physiological needs of his family because of his unexpectedly high connectivity costs.

Safety (security) needs

Safety needs are those that establish stability and consistency in a chaotic and often dangerous world. In recent times, these needs have mostly been psychological by nature. To fulfil these needs, a person has to pay attention to finding and maintaining safe circumstances, stability, and protection. He/she might develop a need for structure, order, and boundaries. Security needs include being able to live an area that is reasonably well protected from threats. For example, if a man or woman's home is not a safe place because he or she is regularly physically abused in that home, then he or she will not be able to progress to the next level on Maslow's hierarchy. These higher needs can only be fulfilled once physiological needs have been taken care of. Understanding this need was important for understanding the conditions under which learners worked on the *CyberSurfiver* module. For example, some learners indicated that they were worried by the suggestion that they work in the computer laboratories on campus so as to save on their connection costs because they would then have to drive home on their own late – at night. This is not always a safe option, especially in South Africa where crime statistics are among the highest in the world.

Love and belongingness (social) needs

Social needs such as love of family and friends are the next level. At this level, a person begins to feel the need for friends, a lover, children, affectionate relationships and friendship, and even a sense of community. Humans have a desire to belong to groups such as clubs, work groups, religious groups, or gangs. The need to feel loved in a non-sexual way and to be accepted by others becomes important. If one is unfulfilled on this level, on is increasingly susceptible to the

debilitating effects of loneliness and social anxiety. In *CyberSurfiver* this need was especially prominent because most learners demonstrated a strong urge to belong and be recognised as valuable by their groups.

Esteem (ego) needs

Maslow (1954) identified two different sets of self-esteem. He distinguished between the need for the respect of others, and the need for prominence, fame, glory, recognition, attention, reputation, appreciation, dignity and dominance on the one hand, and the need for self-respect, self-assurance, competence, achievement, mastery, self-determination and freedom on the other. Self-esteem can thus either arise as a consequence of some kind of competence or the mastery of a specific task, or it could be an effect of attention from and recognition by others. My understanding of the dynamics of a particular group was often directly related to my understanding the learners' esteem needs in that group. Some enjoyed the recognition they got from being able to help others to gain mastery of technology skills while others indicated that they experienced the fact that they were not voted off as an ego boost.

Self-actualisation (fulfilment) needs

Maslow (1954) describes self-actualisation as an ongoing process involved in a cause outside one's own skin. Self-actualisation needs include the human need for purpose, personal growth, and the realisation of potential. At this level, people become fully functional; they act in accordance with their own preferences and will have integrated personalities. They will work at something that is meaningful and valuable to them. Their work (however humble) will be a profession or a calling to them (in the sense of being a 'calling'). These people are healthy, strong, wise, and creative. The need for self-actualisation is the desire to become more and more what one is, to become everything that one is capable of becoming.

People at this level have an opportunity to maximize their potential. They can seek knowledge, peace, aesthetic experiences, and self-fulfilment. The whole *CyberSurfiver* module was designed to provide learners with the opportunity to reach a level of self-actualisation. This need was also important for interpreting the *CyberSurfiver* artefacts and other data, and for understanding learners' needs for fulfilment. By the end of week 6, most learners had expressed their amazement at the amount of learning and personal growth that they had experienced as a result of the *CyberSurfiver* module.

Maslow's hierarchical theory of needs is often represented as a pyramid, with the larger, lower levels representing the lower needs, and the apex representing the need for self-actualisation. Maslow believed that obstacles to self-actualisation could include

education. *CyberSurfiver*, however, focused on a growth. Learners were encouraged to grow into self-actualising people of the kind that they wanted to be.

Apart from understanding how Maslow's hierarchy accounts for some of the interactions in the *CyberSurfiver* module, it was also important for me to explore the qualities that encourage intrinsic motivation. For that reason, I used Malone and Lepper's taxonomy of intrinsic motivation.

Malone & Lepper's taxonomy of intrinsic motivations for learning

Research into the motivational factors as they relate to educational computer games has in the past two decades largely been based on Malone and Lepper's (1987) theory of motivation. Malone and Lepper (1987) defined intrinsic motivation in terms of 'what people will do without external inducement'.

Intrinsically motivating activities are those in which people will engage for the sake of interest and enjoyment. Malone and Lepper (1987) have integrated a large amount of research on motivational theory into a synthesis of ways to design environments that are intrinsically motivating. They argue (1987a) that intrinsic motivation is stimulated by four qualities, namely challenge, curiosity, control, and fantasy.

Challenge

One of the most powerful individual factors that influences intrinsic motivation is *challenge*. Meyers (in Waal 1990) states that challenge and interactivity are powerful enough to keep learners motivated and engaged in the learning process, especially if learning takes place in the context of a game. Learners pursue tasks that they perceive as challenging, and learners are challenged when they direct their activities toward personally meaningful goals in situations in which the accomplishment of their goals is uncertain. Neither success nor failure should be *guaranteed*. Learners are best motivated when they work toward personally meaningful goals in situations where realisation requires activity at an optimal level of difficulty. If learners believe that they are making acceptable progress toward a goal and if they are experiencing satisfaction from the realisation of that goal, their self-efficacy will be enhanced and their motivation will be sustained. Four factors influence the contribution of challenge to motivation. These are goals, the level of certainty, performance feedback, and self-esteem. When designing *CyberSurfiver*, I explicitly included learner activities that were included because of their level of challenge. In meeting such challenges, learners became

thoroughly engaged in the process of trying to accomplish the tasks.

Curiosity

Curiosity also influences individual motivation because it is stimulated when something in the physical environment attracts attention, or when there is an optimal level of discrepancy between current skills and how these might be improved if the learner engaged in some learning activity. *Novelty* and *interest* are factors that express the motivational use of curiosity. The two types of curiosity that can stimulate intrinsic motivation are sensory curiosity and cognitive curiosity. In designing *CyberSurfiver*, I built an element of curiosity into the immunity and reward challenges. Learners also seemed to find receiving the new assignments for each week exciting because they looked forward to Thursday evenings with high levels of anticipation and interest. I often structured the tribal and individual assignments with novelty in mind – as when, for example, I provided links to academic articles that had to be read and discussed in Morse code.

Control

Another factor that influences intrinsic motivation is control. This refers to the basic human need to control one's environment as far as one can. Learners all want to control what happens to them in the learning environment. Three elements influence the contribution of control to intrinsic motivation. They are cause-and effect relationships, powerful effects, and free choice. It was important for me to keep dimension of control in mind as I explored interactions (especially learner-learner and learner-interface interactions) in the *CyberSurfiver* module because the *lack* of control often diminished learners' satisfaction with the module.

Fantasy

One way in which to make learning more appealing and motivating is by presenting the learning material to learners in an imaginary context which is nevertheless familiar (Malone & Lepper 1987). The fourth factor that influences individual motivation is therefore fantasy. Fantasy is operative when learners use mental images of situations that are not actually present to stimulate their behaviour. Garris *et al.* (2002) state that motivation can be generated by providing optimal levels of informational complexity – and by including 'imaginary or fantasy context, themes, or characters'.

When they engage in learning activities, learners should use their imaginations to meet challenges, satisfy curiosity, exercise control, and experience interpersonal motivations without directly participating in the imagined activities themselves. Cordova and Lepper (1993) show that instructional material that is presented in a fantasy context that learners

find interesting leads to increases in both learner interest and in learning itself. Three issues that influence the degree to which fantasy influences intrinsic motivation include emotional elements, cognitive elements, and endogenous fantasies. The design of the *CyberSurfiver* module fully embraced fantasy as one of the ways to make learning more appealing and motivating because of its use of the *Survivor*© metaphor.

In my opinion, no study that touches on motivation and the use of technology in education would be complete without mention of Keller's ARCS model for motivation (1983). The next section explores the four components of motivation as suggested by him.

Keller's ARCS model

Keller (1983) presents an instructional design model for motivation that is based upon a number of other theories. His model suggests a design strategy that embodies four components of motivation: the arousal of interest, creating relevance, developing an expectation of success, and producing satisfaction by means of intrinsic/extrinsic rewards.

Attention

According to Keller and Suzuki (1988), attention increases perceptual arousal if it stimulated by the appearance of novel, surprising, out-of-the-ordinary and uncertain events. To achieve this, a teacher should increase investigation and inquiry arousal by stimulating information-seeking behaviour. Interest can be maintained by varying the elements of instruction. The teacher could also pose questions and provide problems that have to be solved. In designing *CyberSurfiver*, I specifically paid attention to this component. I wanted to arouse the learners' interest in the web as a resource and medium for communication and did so by introducing a variety of learning activities. The reward and immunity challenges were specifically aimed at stimulating information-seeking behaviour.

Relevance

Relevance in the form of, for example, concrete language and familiar concepts, increases motivation. Teachers are encouraged to provide examples and concepts that are related to learners' previous experiences and values. They should also present learners with clear outcomes and choose learning content that will be remain relevant in the future. My presentation of the *CyberSurfiver* in an online mode addressed the need for making learning relevant for future use. As learners in the field of computer-integrated education, these learners may well be in a position one day to present an online course. Because I feel strongly that there is no better teacher than experience, I designed the *CyberSurfiver*

module to expose the learners to an authentic online learning experience. Because of this, I knew that they would know how to approach teaching online at some future date and that they would also know what to look out for in terms of challenges.

Confidence

If learners are enabled to succeed, they develop confidence. Csikszentmihalyi (1990) states that the level of perceived challenge should balance the perceived level of skill before an optimal state of flow can be acquired. Confidence presents a degree of challenge that allows for meaningful success in both learning and performance conditions. Confidence generates positive expectations. *CyberSurfiver* was designed to challenge the learners to move out of their 'comfort zones' right from the moment of the first week's assignments. My aim, however, was to provide learners with opportunities to achieve small successes by the end of each week. These small successes built their confidence incrementally and encouraged them to tackle the following week's challenges with renewed motivation.

Satisfaction

Opportunities to use newly acquired knowledge or skill in a real or simulated setting may result in satisfaction. Teachers should provide feedback and reinforcements that will sustain the desired behaviour. In order to ensure satisfaction, consistent standards and consequences for task accomplishments should be maintained. In *CyberSurfiver,* I regularly encouraged learners and provided them with both general and detailed feedback in order to keep their levels of motivation high. The learners also experienced feedback in terms of their own artefacts. This provided them with solid evidence of their progress in learning.

Herzberg, O.Houle and Lieb's learning motivators

These 3 scholars are also included in this discussion because they all identified learning motivators or satisfiers that (in my opinion) would also be appropriate and helpful for my design.

Cyril O.Houle (1988) conducted a study on what motivates learners. He identified three categories under which motivational styles could be categorised. They are goal-oriented learners, activity-oriented learners, and learning -oriented learners.

Frederick Herzberg (1959) identified six more adult learning motivators or satisfiers. They are:

- Recognition
- Achievement
- Advancement

- Growth
- Responsibility
- Job challenge

Stephen Lieb (1991) also highlights six factors that serve as sources of motivation for adult learning. These are:

- Social relationships – the making of new friends (meeting the human need for friendship)
- External expectations – the fulfilment of the expectations of someone with formal authority
- Social welfare – an improvement in one's ability to serve humankind
- Personal advancement – the achievement of a higher status at work so as to secure one's professional advancement
- Escape or stimulation – the need to relieve boredom and the necessity of having breaks from the routines of home and work
- Cognitive interest – the satisfaction that comes with learning for the sake of learning or learning to satisfy an inquiring mind

Apart from the above-mentioned motivators, adult learners are often faced with a number of hindrances that impede or prevent their participation in learning, hindrances such as lack of time, money, confidence, interest, a lack of information, scheduling problems, domestic problems (such as those that relate to the necessities of childcare and the need for transportation). If a learner, for instance, does not recognize that he/she needs specific information, or if he/she is worried about the babysitter that is looking after his/her children so that he/she could attend a class, all the facilitator's efforts to help the learner to learn will be in vain. Lieb (1991) suggests that facilitators motivate their learners by setting

- a feeling or tone for the lesson
- an appropriate level of concern
- an appropriate level of difficulty

In addition, learners need to receive specific feedback in the form of their learning results. They need to become aware of the rewards that are the result of learning. Such, for example, may be an understanding of the benefits that accrue from learning. Finally, the learner must appreciate the benefits that accompany learning in order to be interested in a learning area.

These and other motivational models and theories show that there are various factors, such as recognition and cognitive interest, which may encourage adult learners when they undertake learning activities (Herzberg 1959; Lieb 1991). This section also discussed Maslow's Hierarchy of Needs (1954), Malone and Lepper's taxonomy of intrinsic motivation (1987), and Keller's ARCS model (1979). It also explained how I incorporated these factors into the *CyberSurfiver* module.

Group formation

Since *CyberSurfiver* was designed to incorporate a wide variety of interactions such as learner-learner, learner-instructor and learner-content interaction, collaboration and working together in groups played an important part in the research. It was therefore essential for me to review the literature before I designed the CyberIsland learning experience.

Groups are made up of individuals with unique personalities, personal needs, abilities, and levels of self-esteems (Johnson & Johnson 2002). Each personality brings with him/her a unique complexity in terms of needs, skills, and styles. It is impossible to judge any one individual's effectiveness solely on the basis of what we know about him/her as an individual. It is necessary to examine the interaction between an individual learner and the others in the group to see how these personalities fit together to form a workable system (Wood, Phillips, & Pedersen 1996).

While groups may often *appear* to a superficial observer to be chaotic, what we may actually be seeing is a high degree of complexity and many forces working simultaneously (Heldal, Bråthe, & Schroeder 2003). It is important to understand that there are a number of key factors that influence both individual and collective behaviour in a group. These include the environment that surrounds a group, individual members, the size of the group, a group's purpose, and group history (Wood, Phillips, & Pedersen 1996).

Working together in small groups played a major role in the *CyberSurfiver* module because learners were divided into tribes of no more than six members each. These tribes had to collaborate and cooperate with each other on a large scale.

Small groups have been defined by Catchart, Samovar, and Henman (1996) as a 'gathering of people interacting and communicating interpersonally over time in order to reach a goal'.

Samovar, Henman and King (1996) define a small group discussion as 'communication among a limited number of people in a single place, directed toward the achievement of a common goal'.

The phenomenon of groups is based on a number of premises and foundations, such as group size, purpose/common goal, sense of belonging (membership), single place/face-to-face interaction, behaviour, resources, roles, types of groups, small group discussion, group process, time, context, competition, personal differences, and cultural and gender sensitivity. The remainder of this section is dedicated to discussing these foundations.

Small group development

Several different models of small group development is suggested by research as researchers all over the world have studied groups to understand how they are build up. In fact, some 115 different developmental modes for groups exist to demonstrate how a group may progress over time (Conyne 2003). The table below summarises the group development models that are in my opinion most common, namely those of Tuckman (1965), Fisher (1970) and Tubbs (1995)

Tuckman's Small Group Development Theory (1965) entails five stages, namely forming, storming, norming, performing, and adjourning. In the forming stage, group members learn about each other and the task that needs to be accomplished. As they become more comfortable with each other, group members experience conflict and compete for their particular standing in the group. This signifies the beginning of the storming phase. The norming stage is characterised by the establishment of implicit and explicit rules about how group members will achieve their goal. In the performing stage, group members reach conclusions and implement them. As the group project ends, the members break up into what is called the adjournment phase.

Fisher (1970) developed a Small Group Development Theory that consists of four phases, namely orientation, conflict, emergence, and reinforcement. Initially the group members get to know each other in the orientation phase. They may experience primary tensions and a couple of awkward moments before communication rules and expectations are established.

Table 6: Common group development models

Tuckman (1965)	Fisher (1970)	Tubbs (1995)
Forming	Orientation	Orientation
Storming	Conflict	Conflict
Norming	Emergence	Consensus
Performing	Reinforcement	Closure
Adjourning		

During the conflict phase, secondary tensions may arise, and learners will disagree with each other and debate ideas. The emergence stage arrives when the outcome of the group's task and its social structure become apparent. In the reinforcement phase, group members

reinforce their final decision by using supportive and nonverbal communication.

Tubb's Small Group Development Theory (1995) is also divided into four stages, namely orientation, conflict, consensus and closure stages. During the orientation phase, group members start to talk about the problem and they examine the limitations and opportunities of the project. In the second stage, group members resist conformity by evaluating ideas. They also experience conflict during this stage. Then the group reaches consensus as group members compromise, select ideas and agree on choices. During the closure stage, the result is announced and group members reaffirm their support for the decisions that have been made.

Groups take time to develop. How long they will take depends on the size of the group, the frequency of interaction and structural features (among other elements). This development can take from take from anything up to an hour, to an entire course.

Group size

Atherton (2003) states that a group is a collection of people in each other's presence who are aware of each other and who interact with each other. The number of people in a group is significant because it influences the process and outcomes of problem solving in a group. Most sources set the minimum number of people for small group collaboration at three, and the maximum number at between 12 and 15 (Samovar, Henman & King 1996; Atherton 2003; Lovegrove 2004; Millis n.d.).

Samovar, Henman & King (1996) maintain that the minimum size for a group to exist is three people, while the maximum number should be nine or ten. They further believe that a three-person group is the minimum size if certain important group properties or characteristics are to emerge, such as communication networks, leadership, coalitions, and majorities. They also argue that larger groups with 9 or 10 members diminish the participation of individual members, and are not likely to be able to sustain relationships between the members of the group.

It would seem as though efficiency in problem solving drops when a group exceeds these limits in size. They fix their *ideal* group size for problem solving groups at between 5 and 7, with the odd numbers serving to prevent deadlocks (Catchart 1996; Wood, Phillips & Pedersen 1996; Samovar, Henman & King 1996).

In *CyberSurfiver* the group size was initially fixed at six members per tribe. However, as the voting progressed, these numbers dwindled in the original tribes and grew in Tribe 5 (the tribe that was designated for those learners who were voted off).

Purpose or common goal

Groups usually have a mutually interdependent purpose because the entire group is dependent on the success of all the other members (Buher & Walbert 2004). This shared commitment to a common purpose is the factor that distinguishes a group from a mere random gathering of individuals and small group discussions that take place in a casual, unstructured way (Samovar, Henman & King 1996).

In a group, individual members rely on each other to accomplish their common objective. In group discussions, communication is directed toward the achievement of this objective because the group is structured and constrained by the goal that needs to be achieved. According to Johnson, Johnson and Smith (1998), instructors can build positive interdependence into the structure of the group by creating common goals that maximise individual and group productivity.

Samovar, Henman and King (1996) further comment on this by saying:

> Shared commitment is one of the reasons that groups develop norms or standards of behaviour. These explicit or implied expectations are often unique to a given group and serve to unite the group members or to cause rejection when one of the members violates a group rule.

Catchart *et al*. (1996) make a distinction between a task-oriented groups in which a desire to achieve a commonly agreed upon goal is shared, and friendship (maintenance-oriented) groups in which members rely on one another for support and to satisfy their need for inclusion. In both these cases, though, the success of the group depends on the contributions of each individual.

In reality though, individual members may very well not be concerned with or committed to the group task. Such an individual may have personal purposes or issues such as dealing with a sick family pet or relocating a home, that are at cross-purposes with the group's goal. It is therefore true to assert that the level of commitment of individuals will vary in degree. While some group members remain only peripherally involved, others devote a major part of their lives and activity to the group and become centrally involved.
In *CyberSurfiver* all the learners had to work collaboratively in order to reach the outcomes that were stated in the tribal assignments. Each learner also had individually to reach certain goals as specified in individual assignments. Even though learners had to work on these individually, peer support was encouraged by the way in which I designed the module.

Sense of belonging (membership)

Group members usually wish to identify themselves as a member of a group by means of shared characteristics that help participants to define themselves through membership in a particular group. William Shutz, in Cathcart *et al.* (1996), identified three basic needs that motivate people to join groups. They are inclusion, control, and affinity. To feel connected to other humans is the basic need that humans have to belong. Recognition from the group one belongs helps to satisfy this need for involvement. Myers (2003) states that 'belonging happens when you identify with another entity – a person or organization, or perhaps a species, culture, or ethnic group'.

The perception that we are able to manage (control) our destiny is another need that is addressed by group membership. A feeling of power arises out of sensing that we can direct others as well as ourselves.

Humans need and want affection (affinity) from others in relationships, and this need is once again fulfilled by group affiliation. Whether we need friendship, attachment, or concern, groups provide opportunities for us to receive these inputs.

I designed the *CyberSurfiver* module with the aim of ensuring small group membership for all the learners. Each tribe had to create its own name and innovative logo. My purpose in requiring this was that learners would cooperate and support each other in protected small-group environments.

Single place or face-to-face interaction

Traditionally, communication in small groups has been defined as face-to-face interaction as group members need to speak to each other in the group and ad the need arises to respond to nonverbal signs. Group members need to react and respond to one another, and the immediacy of feedback in face-to-face encounters makes this possible. When participants communicate face-to-face in a small group, they can obtain maximum advantage from both verbal and nonverbal communication clues. Group members are able to adjust, control, and correct their exchanges of ideas as they constantly see and hear each other.

When all these communication channels are working properly and when a maximum number of communication cues are available and understood, communication can be optimally effective for a group that works together towards a common group goal.

According to Cathcart *et al.* (1996), the advent of electronic interactions challenges the necessity of the face-to-face element of a small group. Because of this some theorists

have expanded the definition of groups to include *a group of people who interact via a computer network over a period of time to achieve a specific goal* (Atherton 2003). In *CyberSurfiver*, the much-needed synchronous communication was made possible by the introduction of *Yahoo Messenger*. Even though the learners did not have access to traditional nonverbal communication cues, all the other factors that define group interaction were still present. But some learners were compelled by their circumstances sometimes to communicate from different communication environments. Thus, for example, one learner worked from home and another from the office. This sometimes made it difficult to communicate effectively.

Behaviour

Cathcart *et al.* (1996) classify the behaviours and actions of group members by determining whether the behaviour *increases* or *decreases* the group's effectiveness. They used the terms *functional* and *dysfunctional* to indicate whether an individual in the group was increasing or decreasing the productivity and advancement of the group as a whole. Functional behaviour occurs when individuals encourage participation on behalf of quieter members, when they clarify messages about whatever it is they are working towards, and when they create an open, supportive climate. If they do these things, participants are helping to define the goals and direction of the group, increasing their efficiency, and advancing the group's overall purpose.

Dysfunctional behaviour is exhibited when unproductive and disruptive behaviour leads to defensiveness, or a feeling among group members that they are not accepted, liked, or included by the other members. The group no longer functions in a productive way when a group member feels self-protective, distrustful, or threatened in some way. Groups often need to exert enormous efforts to identify and to correct dysfunctional behaviour among group members (Cameron 2000). According to Cathcart *et al.* (1996):

> excessive criticism of another individual, preventing ideas and feelings from being expressed, verbal attacks, and excessive joking, are examples of conduct that limits a group's progress.

In *CyberSurfiver*, learners displayed both functional and dysfunctional behaviour. Each tribe defined its own norms for actions, good behaviour, and its expectations for inclusion in the group. Whether they were explicit or implicit, these rules defined the behaviour of tribal members and made the group stronger or weaker. The success of the tribe depended on whether or not its individual members accepted and applied these

norms and fulfilled the role expectations that were associated with them.

Resources

Apart from having different personalities and attitudes, group members also bring particular abilities to the group. Nobody is talented in every sphere of the human condition. The group needs to find and utilise each member's strength while discouraging any display of skills that might undermine the work of the group.

It is mostly in group discussions that resources are pooled for working towards the common group goal. Failure to do so may be attributed to any number of reasons. These include instances where vital information is intentionally or accidentally withheld, where the value of a particular member is ignored, where the resolution of the task may not require the pooling of talents, or where the strained relationships among group members may preclude free contributions.

I designed *CyberSurfiver* with this principle in mind. As the selection process described in a later chapter of this thesis will show, the initial tribe members all brought their own unique personalities, skills, knowledge, and experiences to the table.

Roles

I am of the opinion that two particular roles, namely task roles and socio-emotional (maintenance) roles, are present in all groups. They each relate to certain expected behaviours that are associated with a specific position within a group. Task roles or behaviours are oriented toward goal completion. People in a group who perform task roles, exhibit behaviour that shows a concern for achieving the stated outcomes for the group and for doing this well. This type of person helps a group to stay focused.

On the other hand, people that display a primary concern for *people* and the relationships that exist among group members, take on the socio-emotional role in the group. They are concerned with and interested in how people are getting along with one another, and they want to know if participants like or dislike each other. They are also sensitive to whether people feel included or hostile.

People do not always choose to play only one particular role in a group. A number of roles may be taken on as members display a combination of task *and* socio-emotional behaviours.

The above-mentioned roles develop differently in each group, and more than one member may perform a particular role. The ideal group environment is created when

there is a balance between a concern for the goal and the well being of the people involved.

Cathcart *et al.* (1996) identify three roles that group members assume. These are relationship-oriented, self-oriented, and task-oriented roles. Relationship-oriented roles deal with interpersonal relationships. Members who play this type of role focus on reducing tension, mediating conflicts and attempting to reconcile differences. These group members encourage less talkative members and create harmony by praising and encouraging others. They are also the ones who exhibit acceptance and tolerance.

Self-centred members may detract from the effectiveness of the group because they often have hidden agendas that are not easy to recognise at first glance. By being (for example) stubborn, resistant, manipulative, and distant, such members may detract from overall group effectiveness by drawing attention to themselves and their personal accomplishments in a non-productive way. A selfishly self-absorbed member may either be self-aggrandizing or he/she can might attack the status or undermine the self-confidence of other group members by attacking the contributions of others or by being generally negative. Such people may also bring a number of unique qualities into the group. For example, they may become the focus of aggression, or act as a release valve for pent up pressures. Nonetheless, their contributions are generally counterproductive.

The group composition in *CyberSurfiver* was not specifically designed to ensure that each tribe had a healthy mix of both types of roles. In the game itself, the roles evolved naturally and spontaneously. Those tribal members who displayed task-oriented behaviour aimed to facilitate goal completion. These learners concerned themselves with task realisation and they tried to keep the tribe focused on its goal by defining objectives, guiding discussions, encouraging people to participate and by sharing personal opinions and helpful information. They also energised the group when interest flagged.

Types of groups

Groups are formed for a variety of reasons. They may be well defined, structured, or spontaneous (McGrath1984). In my opinion, two categories may be helpful here: *obligatory groups* and *voluntary groups*. Obligatory groups are groups that individuals feel compelled to join. Pressure to join such a group can either be subtle or explicit.

Voluntary groups are groups that individuals may join because they desire to be members. Belonging to the group meets the person's individual needs. These groups can be strongly structured (as in a sport team), or

decidedly unstructured – as when a group of colleagues chat in an idle and unstructured way around (say) a water cooler.

CyberSurfiver demonstrated both of these categories (as will be shown in later chapters). Originally learners had no option but to join a particular tribe. Soon after the module started, however, learners asked to be allocated to other groups – especially in those tribes where it soon became evident that a large number of learners were going to be inactive. Problem-solving tribes were created when several learners shared the common tribal tasks and communicated with each other in order to complete the tribal assignments (Borchers 1999).

Group process

Factors such as time, place, the moods of group members, underlying conflicts, styles of leadership, group effectiveness, and norms are all indicative of how a group is interacting. All these elements formed part of the *CyberSurfiver* group process.

Synergy is a group process phenomenon that permits groups to make better decisions than could be made by individuals who work alone (Cathcart *et al*. 1996). A combination of talents and knowledge is (logically) greater than the sum of any one individual's contributions. Groups are often more efficient than individuals because the ideas of one person trigger a response from another person that neither might have thought of individually.

Communication

A large body of literature exists on the topic of communication (Motley 1990; Hauser 1996; Losee 1999). For the purpose of this study, however, I have chosen to define communication as 'a process whereby symbols generated by people are received and responded to by other people' (Samovar, Henman & King 1996).

This definition suggests that communication is a transactional process and not simply a one-way sequence of events involving an active source and a passive receiver. Communication is also symbolic and includes symbol generation, perception, encoding, and symbol-reception decoding. It is thus important to realise that meaning is created by an individual person and that it is not inherent in symbols alone. To avoid a breakdown in communication, two people must assign the same meaning to a word or a gesture. Communication is said to have occurred only when symbols have been accurately received and responded to. The receiver needs to decode the intention of the sender. This is the most significant part of the transaction. According to Samovar, Henman and King (1996), 'Communication is a

dynamic, complex process that produces limitless chances for failure.'

Each individual in the *CyberSurfiver* tribes brought with him/her different language and communication skills. Later discussions will show how easily a breakdown in communication originated due to perceptual differences and conflict.

Time factor

Many instructors fear that if they use class time for group work, they will not be able to cover enough content (Wood 2004). This is because collaboration takes time in face-to-face situations – and it does so in an online classroom as well. Time constraints often affect online group processes. It happens time and again that groups feel that they do not have sufficient time adequately to consider their task. Real, or perceived, time constraints exist in most groups, and these pressures often affect the outcome of the group task (Samovar, Henman & King 1996). The *CyberSurfiver* group was no exception to this, as later chapters will indicate.

Conflict

Within groups, disagreements, mild irritations and conflict scenarios often occur (McNamara 1999). Wood (2003) argues that most of the troublesome cases of conflict in group learning are associated with group assignments that are poorly designed. Often conflict arise over the issue of which member will be allowed to make decisions about who will do what, or who will have to perform the easiest and the hardest tasks. In other cases learners may disagree about decisions that need to be made, and will become impatient with learners who fail to meet deadlines. Occasionally, the conflict is content-based and will arise out of differences of opinion about the quality of another person's work. Blohowiak (2004) confirms the importance of having a conflict resolution process in place. Later chapters will deal in more detail with the conflict that was experienced during the *CyberSurfiver* module.

Context

Groups should not be considered apart from their context because they are always rooted in a variety of other systems such as their families, their work environment, and their financial and infrastructure status (Wood, Phillips, & Pedersen 1996). In these contexts, the group influences the environments in which it is embedded, and is likewise influenced by them.

As group members interact with each other and with their own environments and realities, the potential for conflict that arises out of incompatible demands is ever present. Certain individuals may lack the time and energy effectively to participate in the group. This will give rise to tensions, and, as it does so,

stress levels in the group will increase. This will often lead to a conflict of interest between the demands of two or more systems. Such demands may be those that are generated by (for example) taking the course and those that are generated by (for example) raising a family. Sometimes an individual may sacrifice membership in one of his/her systems, or he/she may reduce investment in a group or system, or may suffer the consequences of burnout (Wood, Phillips, & Pedersen 1996). It is therefore clear that groups interact with their environments in mutually influential ways. The external environment in which group members find themselves may limit the behaviour of the group.

In order to ensure survival, group members must be sensitive to the values of the communities that its members belong to. It is important that each member respect the values that are brought into the group by other group members. Group members do not usually sacrifice their loyalties to outside constituencies when they join a group. Most of the dynamics in the *CyberSurfiver* module arose from the fact that the various members of tribes not only belonged to different communities with different value systems, but also because the individual realities of each member often differed enormously from those of others.

It would be humanly impossible to define the context of the *CyberSurfiver* module without imbuing it with my own particular subjective slant. In the chapters that follow I therefore only report *my* interpretation of the contexts, situations, issues and events as I perceived and understood them.

Competition

Adjacent groups often influence other groups because group morale and cohesiveness increase in a group that perceives itself as being in competition with another group. This often leads to antagonism toward both the other group and towards the individuals in it. Group members frequently evaluate the work of other groups unrealistically: they either evaluate or underestimate the work of their competitors (Wood, Phillips, & Pedersen 1996). In later chapters of this thesis, both the aspects of peer assessment and interpersonal and intertribal competition in the *CyberSurfiver* module will be addressed in more detail.

Personal differences

Every group member brings unique personalities with different attitudes into the group. While some may exhibit functional, cooperative and selfless behaviours, others may bring dysfunctional, competitive, and self-serving attitudes. Conditions that stimulate and invigorate some may retard and trouble others (Samovar, Henman & King 1996).

Self-esteem has an important influence on participation. Those with a high self–esteem are usually more willing to take risks by (for example) offering ideas. They can take criticism, assume their share of blame, and can take credit graciously. By contrast, those with a low self-esteem tend to be hypercritical of themselves and others. They may be defensive about their worth and efforts, pessimistic about what the group can achieve, and they may need constant assurance of their merit, even though they may be inept at fielding compliments and praise (Meyers & Meyers 1973).

In my opinion, members of a group can affect the self-esteem of colleagues by rewarding constructive contributions and by diverting counterproductive activity.
Discussions of small group learning and its benefits have become commonplace in higher education today (Slavin 1991; Kagan 1992; Stahl 1994). Proponents of small group learning argue that working together promotes active learning, critical thinking, conceptual understanding, the long-term retention of material, and high levels of student satisfaction. Small groups also provide opportunities for learners in large classes to interact on a smaller scale, and this helps to prepare learners for the real world.

The importance of interaction

In 1916, John Dewey documented the importance of interaction in the learning process by means of learners construct neutral information into knowledge that has personal application and value (Dewey, 1916). The incorporation of effective interaction has been posited as indispensable if online learning experience is to be successful. With emerging educational technologies flooding the market and breaking new ground every day, opportunities for interpersonal interaction can be seen to have increased dramatically if one compares the current situation with the correspondence courses of the past. In those traditional courses, learners and their facilitators hardly ever had opportunities to interact in real time; their communication was restricted to correspondence that took a significant time to reach the intended audience even after it had been produced. In recent times, there has been a move away from this kind of correspondence course model in which learners send assignments to a teacher who eventually returns them with feedback of varying quality on the assignments. The modern trend is towards an environment in which dialogue and interaction can take place and in which learners may be transformed as their personalities are allowed to become visible in the process.

Both video conferencing systems and interactive television have tried to bridge the

time lag between the production of a message and its reception. However, both these technologies have been adjudged to be expensive and not quite as effective as one might have expected.

With the emergence of the Internet it has suddenly became possible to promote high levels of interaction without the excessively elevated costs that adhere to many other technologies. Some educators are wondering whether the online learning environment will provide adequate opportunities for the kind of *genuine* dialogue and social interaction that are vital elements in the learning process (Hobaugh 1997). Even so, e-mail and bulletin boards have made it easier for messages to be sent from one person to another within a cost-effective learning environment (Woods & Baker 2004). Countless opportunities for interaction have opened up since the online environment has been incorporated into the teaching and learning process. As Anderson (2002) states:

> Due to the increasing power of computers (Moore's Law), their increase in functionality when networked (Metcalfe's Law) and related geometric increases in technical capacity (Kurzweil 1999), there is pressure and opportunity to transform teacher and peer interaction into enhanced forms of content interaction.

Anderson (2002) also states that the development of programming tools and environments for those with average computer skills will continue to make this transformation easier and will in some cases place them within the technical domain of non-programming teachers and subject matter experts.

To illustrate the importance of interaction, Wagner (1997) states that 'distance learning practitioners – particularly instructors and program administrators – seem to view interactivity as the defining attribute of contemporary distance learning experience'.

However, there are those who consider interactivity to be the missing vital element of distance education because this type of environment does not permit the kind of face-to-face interactions of the traditional classroom. There are in contrast many studies that claim that contemporary online learning environments provide learners with a myriad of opportunities for effective interactive learning experiences (Simonson 1995; Wagner 1997). Wagner (1997) argues that interactivity in distance education is *just as good* and *even better* than in the traditional classroom. Simonson (1995) encourage teachers to 'make the experience of the distance learner as complete, satisfying, and acceptable as that of the local learner'.

Interaction in itself has very little value in education. It is possible for learners to interact with the learning concepts without them ever being *assimilated* into the body of knowledge that they possess. Reflecting and validating new content therefore need active engagement. Thurmond (2003) defines interaction as:

> the learner's engagement with the course content, other learners, the instructor, and the technological medium used in the course. True interactions with other learners, the instructor, and the technology results in a reciprocal exchange of information. The exchange of information is intended to enhance knowledge development in the learning environment. Depending on the nature of the course content, the reciprocal exchange may be absent – such as in the case of paper printed content. Ultimately, the goal of interaction is to increase understanding of the course content or mastery of the defined goals.

Whereas Daniel and Marquis (1979) refer to interaction as only those activities in which a learner is in two-way contact with another person or persons, Wagner (1994), defines it as

> reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another. An instructional interaction is an event that takes place between a learner and the learner's environment. Its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal. Instructional interactions have two purposes: to change learners and to move them toward achieving their goals.

Research indicates that a high level of interaction, coupled with social engagement, have positive effects on the learning experience (Wegerif 1998; Moore 1989; Hara & Kling 1999; Gunawardena 1995). De Verneil and Berge (2000) state that it is important in most web-based instruction for a designer explicitly to situate learning in a social context because the learning process takes place within a social framework. Collaboration with others generates powerful motivational forces, especially when a positive social dynamic is constructed. Relational dynamics in an online environment are thus of the utmost importance, and the failure to include this component in the design of a learning experience may produce feelings of isolation among learners and an accompanying decrease in retention rates.

But interaction alone is not sufficient to ensure a positive social dynamic in an online classroom (Woods & Baker 2004) because increased interaction may also lead to higher levels of competition, 'flaming', distrust and jealousies. A facilitator needs to aim to move the relational dynamics from mere interaction to authentic intimacy and interpersonal closeness if he or she wants to set the stage for a positive social dynamic. Interactivity is fundamental to the creation of a learning community. This view is supported by many in the field who focus on the critical role of community in learning (Lipman 1991; Wenger 2001). Interaction is also a key learning component in constructivist learning theories because the value of another person's point of view is usually gained through interaction (Jonassen 1991).

Woods and Baker (2004) propose distinguishing between limited dyadic communication, or transaction, which refers to any two components of the online learning environment that connects, and more qualitatively substantive communication, or interaction, which suggests a more nuanced type of contact. Interaction would then reflect an active engagement with the expectation of some level of ongoing communication. Interaction, therefore goes beyond transaction (Woods & Baker 2004).

The rest of the chapter will accordingly highlight the concept of interaction and discuss its theoretical framework and its implications for the online learning environment.

Interaction

There are many different interpretations to the word *interaction.* In this section I shall discuss the various types of interaction as they have been identified by a number of scholars who are, in my opinion, leaders in the field. By exploring the types of interaction that they refer to, the reader will become aware of the complexities that are involved in online interactions.

Downes (1998) identifies three kinds of computer-based interactions, namely, human-to-human interaction, human-to-computer interaction, and computer-to-computer interaction. Human-to-human interaction refers to activities such as sending and receiving e-mails, discussion lists, news groups, and chat forums. Human-to-computer interaction refers to electronic tests that are marked by the computer and electronic games in which a human being plays against a computer. Computer-to-computer interaction refers to interactions that happen between computers that are unassisted by human intervention (such are web spiders and crawlers and timeservers).

Downes (1998) also makes a further distinction between types of interactions. These are time-based (asynchronous and synchronous) interactions, number-based (one-to-many, one-to-one, and many-to-many) interactions, and location-based (close and distant) interactions.

Garrison and Shale (1990) define all forms of education as essentially interactions between content, students, and teachers. Moore (1989) proposed a three-tiered taxonomy of interactions that is important in distance education, and thus in online learning as well. His three-tiered taxonomy of interactions comprises learner-content interaction, learner-instructor interaction, and learner-learner interaction. The Suny Learning Network (Swan *et al.* 2003) agrees and they write:

> The findings of the research on computer-mediated communication and asynchronous online learning are quite consistent. They point to three (and only three) course design factors that contribute significantly to the success of online courses. These are: a transparent interface, an instructor who interacts frequently and constructively with students, and a valued and dynamic discussion.

Moore's three distinct types of interaction were extended and adapted by many researchers in subsequent years. Hillman, Willis and Gunawardena (1994) contributed learner-interface interaction in order to reflect the role of technology in the teaching and learning process. Burnham and Walden (1997) added learner-environment interaction to the taxonomy. Anderson and Garrison (1998) concluded that teacher-teacher, teacher-content, and content-content interactions also needed to be added to the list. Gibson's research (1998) contributed learner-context interaction as another addition. The table below summarises these contributions.

Table 7: Types of interaction

Type of interaction	Author
learner-content interaction learner-instructor interaction learner-learner interaction	Moore (1989)
learner-interface interaction	Hillman, Willis and Gunawardena (1994)
learner-environment interaction	Burnham and Walden (1997)
teacher-teacher interaction	Anderson and Garrison (1998)

Type of interaction	Author
teacher-content interaction content-content interaction	
learner-context interaction	Gibson (1998)

Anderson (2002) states that high levels of more than one of Moore's types of interaction will be likely to deliver a satisfying educational experience. But he also postulates the following equivalency theorem:

> Sufficient levels of deep and meaningful learning can be developed as long as one of the three forms of interaction (student-teacher; student-student; student-content) are at very high levels. The other two may be offered at minimal levels or even eliminated without degrading the educational experience.

The four types of interaction that have been cited most frequently in the literature are learner-content, learner-learner, learner-instructor, and learner-interface (Chen 2002; Ehrlich 2002; Kirby 1999; Rovai 2002; Sherry, Fulford & Zhang 1998; Smith & Dillon 1999; Swan 2001). In the following section, these interactions, as well as learner-context interactions, will be discussed in more detail.

Learner-learner interaction

Woods and Baker (2004) describe learner-learner interaction as communication between two or more students in a course. I however would like to agree with Thurmond and Wambach (2004) who broaden this definition to portray it as the interaction between learners that can occur between

- one learner and another
- one learner and several other learners
- several learners as a group

Learner-learner interaction is intended to stimulate and motivate the learning of the course content. This type of interaction in the online environment often occurs by means of asynchronous communication tools although other forms of communication, both online and offline, may also occur throughout the duration of a course. Interaction among learners can either be immediate, as with an instant message or a telephone call, or a delayed personal encounter such as a posting on a bulletin board.

I prefer not to rely solely on the above-mentioned definitions, and would like to include that of Cowley *et al.* (2002), who state that learner-learner interaction may be

regarded as a four-stage continuum that includes:

- communication
- collaboration
- cooperation
- community

Communication is characterised by learners talking and discussing, while collaboration is about learners sharing ideas and working together. *Cooperation* means that learners do things together and *community* indicates that all learners are striving towards a common purpose.

Elearning excludes physical interaction, which may have an impact on learning (Beard & Harper 2002). Burge (1994) argues that if effective learning is to take place, occur, four types of peer behaviour are essential in an elearning environment. These are:

- participation
- response
- provision of affective feedback
- short, focused messaging

I agree with Burge (1994) who finds that learners expect these behaviours from their online peers. Participation entails that learners show interest in the educational experiences of others, share their perspectives, and demonstrate their application of knowledge. With the response prospect, learners are expected to respond to questions, be dependable in small groups, provide constructive feedback, and actively participate in dialogue. Affective feedback means that learners show patience, offer compliments, and encourage a learning atmosphere that is both affirming and supporting. With focused messaging, learners are expected to avoid excessive messages that do not contribute to learning within the group.

Teamwork, or collaborative learning, involves learners in working together in groups to complete academic assignments (Alavi 1994; Palloff & Pratt 2001). This form of learner-learner interaction promotes understanding and stimulates critical higher-order thinking. Harasim (1989) states that collaboration contributes to higher-order learning through cognitive restructuring or conflict resolution which allow new ways of understanding the work to emerge because of contact with new and different perspectives. Collaborative projects may lessen feelings of isolation and promote a sense of a learning community (Abrahamson 1998; Palloff & Pratt 2001) in the web-based classroom. Cronjé (1997) confirms that cooperative work projects provide a framework in which students may develop deeper relationships with others.

Thurmond *et al.* (2002) report that there are learners who report *less* satisfaction with those courses in which they are required to participate in teams or in group projects in an elearning (Thurmond, Wambach, Connors, &

Frey 2002). Thurmond *et al.* (2002) assert that the challenge of completing course assignments without the face-to-face contact may explain their dissatisfaction.

Research confirms the need for learners to connect with each other in an elearning course (Atack & Rankin 2002; Swan 2001; Soo & Bonk 1998). In designing interactions for elearning courses, a facilitator should therefore ensure that a sufficient number of opportunities for interaction are available. Some studies indicate that the quality of interactions improved in online environments and that the levels of interaction may even surpass that which is possible in a traditional face-to-face classroom (Lenhart, Lytle, & Cross 2001).

Although many learners express their preference for face-to-face learner-learner interaction, the Internet nowadays acts as an effective medium for discourse. Larson and Keiper (2002) reports that learners who frequently did not participate in a face-to-face situations became more conversational in the online environment. This seems to indicate that the Internet provides a comfortable forum for those learners who previously may have felt intimidated or shy.

According to Moore and Kearsley (1996), learner-learner interaction in the online environment contributes to learning. But Muirhead (1999) also found that some learners thought that their learning was influenced negatively because other learners either did not perform their share of tasks or because they participated too late. On the whole however one may say that there seems to be a correlation between levels of interaction and learners' perceived levels of learning (Fredericksen *et al.* 2000).

Educational practitioners agree that learner-learner interaction is of the utmost importance in an online course (Soo & Bonk 1998; Muirhead 2001; McGinn 2000). Facilitators, who teach online, rate learner-learner interaction as the most important form of interaction – followed by learner-facilitator interaction (Soo & Bonk 1998). Although the pedagogical benefit of learner-learner interaction is often acknowledged, teachers should carefully and consciously design learning activities that encourage positive collaboration and cooperation. Parker (1999) states:

> The sentiment of many faculty is to teach the same course offered on campus with the addition of a few more handouts. To those experienced in the art of distance delivery, it is evident that the addition of a few more handouts is not the solution for interactive course design ... The challenge lies in the refocusing of the instruction to embody a component of interaction.

This refocusing may entail group projects, increased class discussions, and may even include making online discussions count for a large proportion of the final mark for a course. Woods and Ebersole (2003) take this even further and include interaction on a more personal level. They report that encouraging learner interaction in personal discussions contributes to constructive relationships between learners and builds a sense of community and satisfaction with the overall learning experience. Efforts to encourage personal learner-learner interaction promote openness between learners and typically lead to high levels of interaction. As interaction strengthens, opportunities for social penetration flourish. These opportunities in turn promote a climate of interpersonal interaction that may have positive benefits for interaction in course-related discussions (Woods & Baker 2004).

Anderson's equivalency theorem (2002) advocates that one could, if challenged, substitute student-content interactions for student-student interaction by recording a learning event or by supplying the learner with extensive notes that can be accessed asynchronously. According to his equivalency theorem, this should not degrade the education experience so long as the interaction remains on a high level. He also postulates that while student-student interaction is critical for constructivist learning, it is not so crucial for cognitive and behaviourist activities.

In summary, it seems that collaborative learner-learner interaction can help learners to learn the course content and ease feelings of isolation. Even though many learners may still prefer traditional face-to-face contact in certain circumstances, most rely heavily on learner-learner interaction when they find themselves in an online course. When these interactions are experienced as positive, learners may perceive higher levels of learning (Thurmond & Wambach 2004). Clow (1999), and Phillips and Peters (1999) conclude that learners' perception of sufficient interaction with other learners is positively correlated with their levels of satisfaction with the overall online learning experience.

Learner-content interaction

Moore (1989) and Juler (1990) both argue that interaction between learners and content has long been recognised as a critical component of both campus-based and distance education. According to Woods and Baker (2004), learner-content interaction is the process in which learners examine, consider, and process the course information presented during the educational experience. Moore and Kearsley (1996) state that

> every learner has to construct knowledge through a process of

> personally accommodating information into previously existing cognitive structures. It is interacting with content that results in these changes in the learner's understanding.

Learner-content interaction results from students examining and studying the course content (Moore & Kearsley 1996). Thurmond and Wambach (2004) agree and define learner-content as the interaction that results from learners examining and studying the course content. The focus is on the understanding and perspectives that learners gain from the knowledge they construct while interacting with the content. Anderson (2002) also comments that the value of content is dependent on the extent to which it engages learners in interaction and leads to relevant knowledge construction.

Leasure, Davis, and Thievon (2000) identified continuous contact with the content as one of the factors that influenced learners' observations about their learning. Swan (2001) mentions the clarity of course design as an important element. One of the barriers to interacting with the course content is that there is not enough time to participate in coursework (Atack and Rankin 2002). One other factor identified by research is that learners' perceptions of learning are affected by the mode of delivery of course content (Faux & Black-Hughes 2000).

Swan (2001) holds that format consistency may influence learners to perceive online learning as being 'easier'. He argues that each content area should be formatted in a similar manner. In addition, learners perceived more learning to have taken place when consistency in the structural design of the course modules was greatest (Thurmond & Wambach 2004).

In the online environment, learners interact with their course materials through reading their textbooks, journals, and discussion forum comments from other learners and their tutors. The subject content provides an academic foundation for meaningful dialogue within a distance education class. While online discussions are not exclusively a form of learner-content interaction, they are also a form of learner-learner and learner-instructor interaction. In online discussions, students learn the course content from the text supplied by others who are participating in the discussions (Thurmond & Wambach 2004).

According to Leasure, Davis, and Thievon (2000), if learners have more continuous interaction with the content in a web-based course, this results in more learning and in greater overall satisfaction with an online course. Faux and Black-Hughes (2000), however, found that learners preferred to learn the course content in a traditional

classroom setting in which they could *listen* to the content rather than read it.

Learner-instructor interaction

Thurmond and Wambach (2004) define learner-instructor interaction as the interaction that occurs among learners and teachers with the intention of helping to reinforce learner understanding of the material or of clarifying meanings. While Woods and Baker (2004) also state that learner-instructor interaction is communication between the facilitator and the learner in a course, they argue that this type of interaction is not strictly limited to the instructional communication that occurs during the educational experience. According to them, learner-instructor interaction may include personal dialogue, offline communication, and the provision of advice.

One research study suggests that students in online courses required more interaction than the face-to-face courses to achieve a similar degree of student satisfaction (Richardson & Ting 1999). Burge (1994) sees the role of the teacher in learner-instructor interaction as

> giving fast and relevant technical help, sending timely and individualized content-related messages and feedback, with, if possible, summaries of discussion and guidance about resources, and offering affective support (welcome, encourage, show empathy, role model support-giving).

Instructors should thus provide counsel, support, and encouragement to all learners, but the extent and nature of this support would vary according to the educational level of the learners, the teacher's personality and philosophy, and many other factors. Other instructor activities in an online course may include stimulating and maintaining the learner's interest, motivating the learner to learn, providing counsel, support and encouragement to each learner, and providing timely feedback to learners so that they could check that all are making adequate progress. Because of the busy schedules and multiple responsibilities of instructors in higher education, they cannot be available at all times to students. They may not have enough time to look at, use, grade, and give feedback for each learner activity.

Anderson (2002) states that student-teacher interaction has the highest perceived value of all types of interaction amongst learners. He also argues that even though student-teacher interactions are the least scalable type of interaction, it can be automated by the development and use of content resources. This transforms student-teacher interactions such as e-mail and bulletin board messages into student-content ones, like Frequently

Asked Questions, video material, and interactive simulations.

One concern in learner-instructor interaction relates to whether active participation from a facilitator in online discussions puts a damper on learner-to-learner interaction. Facilitators often find that when they hold back, the momentum of the discussions flags. Learners may also complain that the facilitator is not involved enough or too inactive. They prefer the facilitator to remain engaged in the conversation and participate frequently. Some learners feel that learner-to-facilitator interaction is key to the learning process (Cowley *et al*. 2002).

On the other hand, if a facilitator takes control and leads discussions, learners may not extend themselves as much as they would have because the 'authority' is always there to assist and to provide direction. According to Cowley *et al.* (2002), the level of instructor-led interaction must thus be a function of the level of learner.

In a traditional classroom environment, the instructor is physically present and can provide and receive immediate feedback through visual and verbal cues. The online learning environment does not always make provision for these types of cues. The online instructor needs to keep the learners motivated to learn, give appropriate feedback and support, and continue dialogue at a distance (Moore 1989). He believes that it is the role of the instructor or expert to plan and teach the curriculum. The instructor should, however, also stimulate and maintain the learner's interest in what is taught. He/she should motivate the student to learn, and augment and maintain learner interest (which includes self-direction and self-motivation). Oliver and McLoughlin (1997) state:

> Communicative interactions can be used to engage learners, to cause them to reflect on and to articulate ideas. Interactions encourage and facilitate cognition and play an important part in promoting learners' intellectual operations and thinking processes (Oliver& McLoughlin 1997).

In the online environment, learner-instructor interaction is usually computer-mediated. As instructors also need to participate in chat room discussions, bulletin boards and e-mails, it is required that they be competent in using the technology that is used in the course. Often however learners in the online environment not only interact with their instructor; they also interact with their technical support crew and tutors.

It has been found that students who interacted regularly with their instructor and with other students were more motivated and

had better learning experiences (Garrison 1990). Garrison (1993) concludes:

> Few chances to interact with the instructor, limits students' ability to clarify and negotiate instructional goals, explore alternative methods, or construct meaning within a social context based on personal knowledge.

Roblyer (1999) and Hacker and Wignall (1997) conclude that learner perception of what constitutes sufficient interaction with the facilitator indicates the learner's level of satisfaction with the online learning course. Interaction between learners and teachers thus plays a critical role in online learning environment.

Learner-interface interaction

Learner-interface interaction occurs when a learner must use technology to communicate with content, to negotiate meaning, and to validate knowledge with a facilitator and other learners. Hillman, Willis and Gunawardena (1994) contributed learner-interface interaction to Moore's taxonomy so as to reflect the growing role of technology in the distance learning process. They state: 'When dealing with any tool, it is necessary for the user to interact with the device in a specific way before it will do his or her bidding.'

In an online course, the learner-interface interaction can have a tremendous impact on students' learning of the content (Hillman, Willis and Gunawardena 1994). Consequently, instructors need to consider the impact that web-based technology will have on learning when designing such courses. They also need to be sensitive to the need for mediation by noting that technically challenged learners may experience the interface as threatening, and by recognising that the interface may easily become an independent force with which learners have to contend.

Thurmond and Wambach (2004) state that learner-interface interaction concerns the technological media that allows learners to interact with content, facilitator and other learners. The emphasis on learner-interface interaction centres on the impact of the technology on student learning.

This type of interaction may be one of the most challenging for first time online learners because they would have had no prior experience in this regard. Learners would have been exposed to most of the other types of interaction in the traditional classroom. In an online learning environment, learners have to be competent computer users in order to participate successfully. They need to be able competently to use basic equipment such as a mouse, keyboard, and printer. They should also have Internet access and a basic level of Internet literacy.

In selecting media for educational delivery, interactivity should be one of the primary criteria for selection. Kozma (1991) states that there are certain attributes of media that specifically allow for interaction. Learners will use technology to interact with the content, the instructor, and other learners, and without learner-interface interaction, these other types of interaction can often not take place.

Learner-environment interaction

Burnham and Walden (1997) state that interactions within a distance education environment always include an element of learner-environment interaction. They define this type of interaction as 'a reciprocal action or mutual influence between a learner and the learner's surroundings that either assists or hinders learning'.

Gibson (1998) makes a link to this definition by emphasising the role that aspects such as family, the workplace, peer groups, mass media and religion play in the learning process. She argues that the distance learner simultaneously engages and interacts with multiple contexts which extend beyond the classroom. Woods and Barker (2004) refers to this type of relation as *learner-context interaction*.

McInnerney and Roberts (2004) also highlight the importance of social context as a factor in determining the success or otherwise of study. They are of the opinion that the social interaction in the online medium cannot be separated from the social interaction that occurs in the everyday world. Matel and Ball-Rokeach (2001) state that the 'theoretical corollary ... is that the social effects of the Internet should be placed in the framework of people's socio-structural connections, including cultural, ethnic, social and local-physical circumstances'. It is thus important for educational practitioners to have an appreciation and understanding of the non-academic social communities of the learners.

Interaction has long been a defining and critical component of the educational process and context. Multiple studies have concluded that increased levels of interaction result in increased motivation, positive attitudes towards learning, higher satisfaction with instruction, deeper and more meaningful learning, and greater achievements (Entwistle & Entwistle 1991; Garrison 1990; Ramsden 1988; Wagner 1994). Each type of interaction poses its own set of opportunities and challenges.

Conceptual framework

In order to be able to investigate the interactions of adult learners in an online course that is based on the metaphor of a game, a number of concepts need to be

placed in a conceptual framework that guides this study. The framework shows the various categories and their interrelated nature.

This chapter started by examining the element of play in learning by stating that very few educational programmes overtly build creativity and enjoyment into the learning process. We saw that there are arguments against the use of fun (enjoyment), games and humour on the grounds that they might make more traditional modes of education seem boring and they may distract learners from the academic outcomes that are intended to be reached (Moore n.d.; Cordova 1993).

But this chapter also showed that others such as Csikszentmihalyi (1975, 1990), and Malone and Lepper (1987) argue that the inclusion of game-like features may have *positive* effects on levels of attention, motivation and learning. Trevino and Webster (1992) confirmed that involvement in a playful, exploratory experience is intrinsically motivating because of its pleasurable nature. González *et al.* (2001) and Grossman and Minow (2003) also conclude that the inclusion of games in the learning process may stimulate a number of attributes such as level-headedness, the ability to analyse and understand, and an increase in motivation.

In order to understand the possible effect that games may have on adult learners and their levels of motivation, we first need to understand how adult learners differ from children. We need to understand the typical characteristics of adult learning. Earlier in the chapter, these characteristics were explained by reference to the work of Rogers (1993), Knowles (1959; 1990), Brookfield (1986), Decker (2002) and others.

Once the characteristics of adult learning have been understood, there is a need to consider adult learning motivators and satisfiers. The motivational factors that Herzberg (1959) and Lieb (1991) identified were mentioned. Some demotivating factors such as deficits in time, money, confidence and interest, as well as scheduling problems and domestic problems were also discussed.

In order to recognise and appreciate the factors that adult learners find motivating, three different motivational theories (models) were discussed. Maslow's Hierarchy of Needs (1954), Malone and Lepper's taxonomy of intrinsic motivations for learning (1987), and Keller's ARCS model (1983) provide the reader with a theoretical framework by means of which the impact of the *Survivor*© game elements on adult learning can be investigated.

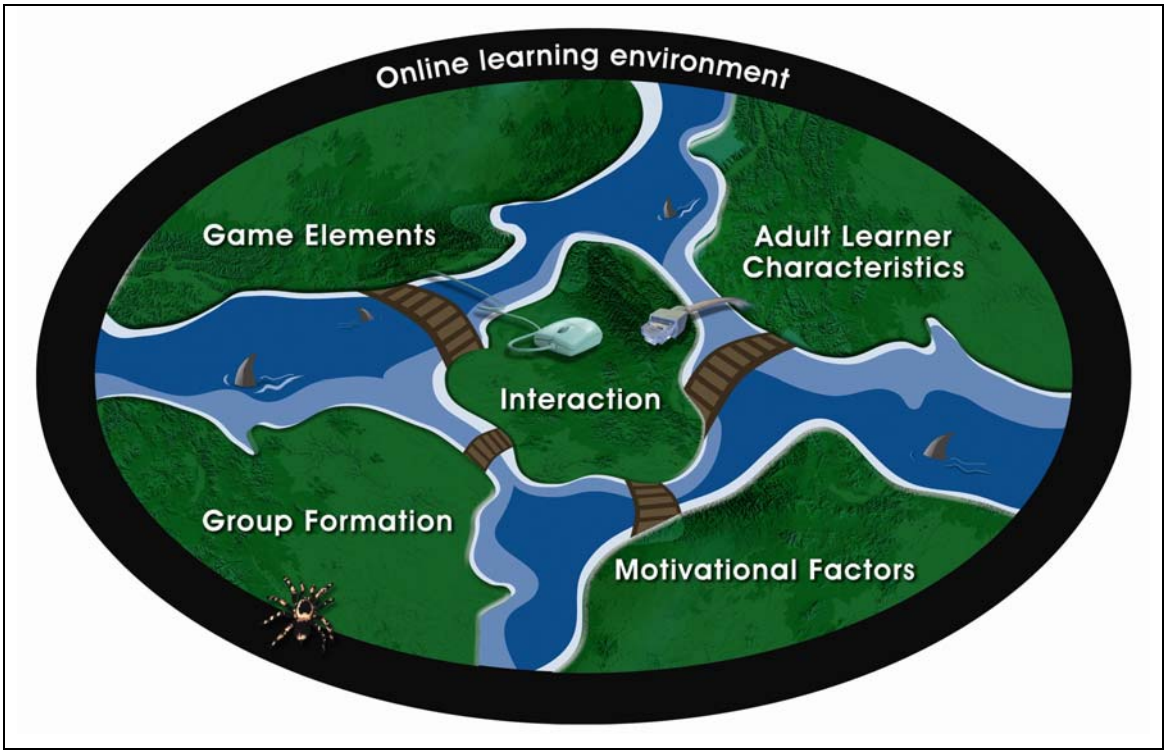
To understand the roles that games play in adult learning, adult characteristics and motivational theories alone may prove to be

insufficient for guiding an investigation into the various interactions that are involved in adult online learning. In addition, a thorough understanding of group formation is needed. The chapter highlighted a number of small group development models (Tuckman 1965; Fisher 1970; Tubbs 1995). It also discussed ideal group sizes, common goals, a sense of belonging, face-to-face interaction, group behaviour, the use of collective resources, team roles, and different types of groups, among others.

It is only when the role of games, adult learner characteristics, motivational theories, and group formation factors are accepted as an indispensable part of the online learning environment, that one can begin comprehensively to examine the various interactions that take place within such a learning community. This chapter identified a number of interactions, namely human-to-human, human-to-computer, and computer-to-computer (Downes 1998). Downes further distinguishes between time-based, number-based, and location-based interactions. Moore (1989) recognised three important interactions in distance education, namely, learner-learner, learner-content, learner-instructor. Additional research by other scholars identified other interactions that exist specifically in a computer-integrated environment. The discussion focused on five specific types of interaction, namely learner-learner, learner-content, learner-instructor, learner-interface, and learner-environment interactions.

The complex interrelatedness of the elements mentioned above establishes the conceptual framework for this study. The following figure (Figure 2) reflects the interrelatedness of the elements that make up the conceptual framework.

Figure 2: Conceptual Framework



Closure

Play and games are not traditionally acceptable modes of adult learning, especially when presented over the Internet. I believe that this is a mistaken attitude because games have the capacity to stimulate both intrinsic and extrinsic motivation, both of which are enormously desirable commodities in the adult learning and elearning environments.

Chapter 2 reviewed literature that deals with the role of games and play in the learning environment. It showed that the introduction of games into any learning environment, be it online learning or otherwise, might increase motivation and attention (Malone & Lepper 1987; Garris *et al.* 2002). Research has also confirmed that by adding elements of fun and enjoyment, games and play can enhance adult learning while at the same time enhancing levels of attention, effort, and concentration (Cordova 1993; Chen *et al*. 1998). The investigation highlighted the characteristics of adult learning and showed how these differ from the learning of children.

I discussed several models of small group development as I tried to understand how these groups are built up (Tuckman 1965; Fisher 1970; Tubbs 1995). I then concluded the chapter by documenting the importance of interaction in the learning environment. This research study aims to investigate the effect

of the *Survivor©* metaphor on adult learners enrolled for an online module about eLearning. We need to investigate the various interactions that are made possible by integrating the modalities of play for adult learners in an online learning environment.

The rest of this study will focus on the dynamics involved between the learners themselves, between the learners and myself as the facilitator, between the learners and the content, between the learners and the Internet technologies, and between the learners and their own environments. In dealing with these different types on interaction, the characteristics of online environments, adult learners, and games will be closely reviewed and related in detailed analysis. The *CyberSurfiver* study aims to show that interactivity need not be excluded from online learning – especially since the introduction of games can be successfully utilised to encourage interaction.

Chapter 2 concluded with the conceptual framework that guided the *CyberSurfiver* study. Chapter 3 will focus on the research design of the study. It distinguishes between the design of the *CyberSurfiver* module and the research study on the interaction that happens in an adult online learning community as a result of the introduction of a game metaphor.