Chapter One

Introduction, Problem Statement and Clarification of the Concept of e-Learning

1.1 Introduction

Currently the potential of e-Learning to deliver flexible and ground-breaking approaches in nursing education, is internationally recognised (Moule, 2006:370). In addition to global demands to utilise e-Learning, the development of e-Learning programmes is promoted by efforts of the Department of Education to ratify e-Learning, through the draft White Paper on e-Education in South Africa (South Africa, 2003).

Health science education in South Africa can benefit richly from the ratification and implementation of e-Learning in South Africa. Since nursing forms part of health science education and the broader educational arena, nursing in particular will benefit greatly by the advantages of e-Learning in South Africa. Furthermore, there is a limitless influx of e-Learning in education and health care, specifically for health professionals, to acquire Continuous Professional Development (CPD) points, as per Docherty and Sandhu (2006:343). Farrell (2006:14) concurs with the previous authors that the interest in the use of e-Learning, to support the education of health professionals, is currently escalating. In South Africa the Department of Health considers e-Learning as an option to support the education of health professionals, especially as there is a shortage of nurses (National Department of Health, 2006:56).

Fuelled by the severe shortage of nurses (WHO, 2004:9), the South African Department of Health requested that Higher Education Institutions supply more competent professional health care practitioners, including a higher number of nurses, without compromising the quality of their training (National
Department of Health, 2006:56). This request by the Department explicitly includes e-Learning approaches to bridge the gap in the shortage of competent nurses (National Department of Health, 2006:58). Adding to the Department's statement, Strother (2002:1) previously suggested that effective learning will be impossible without e-Learning in future.

The previous discussion clearly indicates that e-Learning has a pivotal role to play in the education and continuous professional development of nurses. Change in the education of health professionals, including nurses, therefore becomes inevitable, noting that changes might pose challenges for both educators and learners. However, Caffarella (2002:162) asserts that changes in education should consider the distinctive challenges of adult learners.

Notwithstanding these challenges locally, nursing education, which is part of adult education, experiences the same unabated change globally according to Quinn (2000:56). One of the changes locally is the enactment of e-Education, which is currently a central discourse at the South African Department of Education (South Africa, 2003:2). Following the changes of education to Outcomes-based Education, according to Uswe and Juta (1999:4), e-Education hitherto has become another challenge to curriculum developers and educators in South Africa.

Adding to these challenges is a technology-driven approach where most e-Learning programmes are developed to the exclusion of facilitators and the expectation is that end-users may well embrace such a technologically-driven system (Ismail, 2002:329). Nichols (2006:1), however, points out that the use of technology in education always seems to be technology-led, rather than pedagogy-led. This shortcoming noted in e-Learning based programmes suggests a gap in the planning of effective e-Learning processes, hence posing even bigger problems for the application of e-Learning in teaching and learning (Allen, 2006:38).

Contrary to this opinion, Caffarella (2002:254), in his publication has a different opinion. He is of the opinion that changes in education evolve around
continuous planning and evaluation and improvement of an education system. Caffarella's opinion relates to the rationale that the Department of Education presents in the enactment of e-Education strategies in South Africa, namely advantages like global exposure to knowledge, greater access to education and the alleviation of the digital divide, as outlined in the draft White Paper for e-Education (SA, 2003:4). Another advantage is the fact that e-Learning is more cost-effective than face-to-face training to some employers, as they do not have to spend exorbitant amounts on training, travel and accommodation of employees (Bisoux, 2007:23). Strother (2002:1) emphasises other positive benefits, like convenience, standardised delivery, self-paced learning, as well as a wider spectrum of content.

In conclusion, despite these obvious advantages of e-Learning, educators and learners are faced with diverse challenges in the e-Learning practice. Although training delivered via e-Learning is more than three decades old, using technology to train people still remains an ever-changing discovery (Fallon & Brown, 2003:1), as holds true for nurses' training in South Africa.

### 1.2 Problem statement

The shortage of nurses in Africa follows in the wake of the escalating numbers of HIV / AIDS, tuberculosis and malaria patients, as well as the exodus of qualified nurses to developed countries (Akpabio, 2005:6). This shortage is exacerbated by the fact that continuous professional development has lagged behind in most African countries. South Africa, all the same, is not untouched by the quest for more competent nurses in situations where HIV and AIDS cripple the health practice (National Department of Health, 2006:26). The question that remains is: “How do we sustain more competent nurses, without compromising quality?”

Presently, Mindset Health, which forms a part of Mindset Network, developed an innovative e-Learning system that delivers education on a mass scale, with
the potential to also address the current professional development need of nurses in South Africa, specifically that relating to HIV and AIDS management (Mindset Network, 2007:5). This e-Learning system necessitates a more self-directed learning from nurses. From an educator's perspective the Mindset Health e-Learning system is meant to be the solution to the professional development of nurses, because it is installed at their workplace where they can learn at their own pace and time.

However, despite the expectations of the developers at Mindset Health, as well as the logical thinking of nurse educators, clinical nurses are not utilising this e-learning system effectively (Mindset Network, 2007:5).

In pursuit of the effective education and professional development of nurses, the researcher, a clinical nurse and nurse educator, realised that the reason why nurses are not using the system as expected, may be due to a lack of e-Learning skills, or due to being unprepared and not yet ready to effectively use the Mindset Health e-Learning system. Nurses' negative responses to this e-Learning system urged the researcher to interrogate this actuality.

The following research questions therefore were derived:

• What are the underlying teaching and learning theories of e-Learning?

• What are the prerequisites for effective e-Learning?

• What is the nature of the professional development of nurses?

• Why are nurses not using the Mindset Health e-Learning system effectively for their professional development in a public hospital setting?

• How can strategies be developed to enhance the use of the Mindset Health e-Learning system for nurses' professional development in a public hospital setting?
1.3 Aim and objectives of this research

This research aimed at enhancing the implementation and utilisation of the Mindset Health e-Learning system for nurses' professional development in a public hospital setting. In order to formulate a conceptual framework of strategies that would accomplish this, the objectives of this research included the following:

- To explore the underlying teaching and learning theories of e-Learning.
- To determine and explore the determinants of effective e-Learning.
- To investigate the nature of the professional development of nurses.
- To identify the reasons why the Mindset Health e-Learning system for nurses' professional development is not utilised effectively by nurses in a public hospital setting.
- To formulate a conceptual framework of strategies that would enhance the use of the Mindset Health e-Learning system for nurses' professional development in a public hospital setting.

1.4 Central theoretical argument

The exploration of theories underpinning e-Learning as well as the determinants for effective e-Learning and the exploration of the nature of nurses' professional development, including the reasons why nurses are not using the Mindset Health e-Learning system effectively would lead to the formulation of a conceptual framework of strategies to enhance the use of the Mindset Health e-Learning system for nurses' professional development in a specific public hospital setting. This baseline research will also contribute to further research to address this challenge.
1.5 Clarification of the concept of e-Learning

In order to prevent any confusion as to the meaning of e-Learning in the context of this research, it needs to be clarified first.

In spite of the current popularity of e-Learning, it is often confused with Distance-learning, which is an instructional situation where the learner is separated in time and space from the educator and other learners, or with Online-Learning, which is seen as internet or computer-based education (Heinrich, *et al*., 1996: 408, 413).


Further clarification of e-Learning, according to Farrell (2006:15), is that e-Learning is the facilitation of learning through the use of technology. While Wodecki (2006:82) concurs with the previous authors, he elaborates that e-Learning is divided into synchronous and asynchronous modes. A synchronous mode of e-Learning requires a simultaneous presence of the educator and learners, e.g. discussions and tele-video conferencing, while an asynchronous mode does not require a simultaneous presence of educators and learners, e.g. e-mail, internet sources and interactive multimedia courses. A synchronous mode is bound to time and space, whereas an asynchronous mode is not.

According to Mason, *et al* (2006:40-41), e-Learning encompasses self-paced learning and facilitator-led learning, as well as the current trend, that blends
self-paced and facilitator-led learning to craft an interactive experience for learners.

Ismail (2002:335) is, however, of the opinion that e-Learning does not necessarily imply that all learners will be advancing individually at their own pace, but e-Learning could be collaborative and supportive to educators and learners in some contexts, depending on the e-Learning tools. Therefore different tools are used in different contexts, and may involve the Internet, CD-ROM, different software, and other diverse media and telecommunication resources (Docherty & Sandhu, 2006:343).

Highlighting the context further, Cook and Bacsich (2007:16) define e-Learning as the use of technology to build the necessary skills in the workplace, whilst e-Learning is also described by Cossu et al. (2006:45) as the use of Information and Communication Technologies (ICTs) during learning, e.g. for professional education.

In line with the definitions above, e-Learning in the context of this research can be defined as a flexible process for professional development, where the learning facilitator (in-service trainer) uses ICT to facilitate learning for the learner (clinical nurse) in a public hospital setting (workplace). Furthermore, e-Learning can be synchronous and facilitator-led, meaning that learners require simultaneous presence, or asynchronous and self-paced, where learners do not require simultaneous presence. In this research a blended mode, that includes synchronous and asynchronous modes, is important, due to the fact that blended modes facilitate interactive learning. Depending on the mode, different electronic tools, like the internet and interactive multimedia materials, are used to facilitate professional development. The mode of e-Learning depends on the form of learning, for example, individual or collaborative learning. It is further deduced that the context of e-Learning could be time- and-space bound or ubiquitous, meaning that it can take place in diverse settings, e.g. in the workplace, in the classroom, or at home. Space in this definition can refer to physical space or cyber space. For this research the
public hospital setting (the workplace) is the learning context, and the Mindset Health e-Learning system is the ICT.

1.6 Significance of this research

Nurses form the backbone of the health care delivery system in Africa (Mindset Network, 2007). In most health establishments, especially in public health institutions, the core staff members, who coordinate and deliver health care, are the nurses. It is expected from nurses to remain informed and competent in their service delivery. However, limited education and professional development opportunities result in a shortage of adequately trained nurses in the practice situation. The need for innovative interventions for professional development has become evident. It is to address this problem that Mindset Network invested in the development of an e-Learning system to be installed at some public health institutions in South Africa (Mindset Network, 2007).

As was mentioned, contrary to expectations, nurses do not exploit this opportunity brought to them by Mindset Network to enhance their professional development through e-Learning. Despite being viewed by the developers and nurses as a solution that would assist in professional development, this system remains underutilised. This state of affairs gave rise to the motivation for conducting this research. With the findings obtained in this research the researcher envisaged designing supportive strategies to enhance the use of the Mindset Health e-Learning for nurses’ professional development in a public hospital.
1.7 Proposed research methodology

In this research a single qualitative case study was deployed (De Vos et al., 2002:153). Yin (1984:23) as quoted by Niewenhuis (2007:75), defines case study research as a systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest. Hence a qualitative approach was used to establish why the Mindset e-Learning system is not effectively utilised in nurses' professional development in a public hospital setting, as well as how the utilisation, through an Appreciative Inquiry strategy, of the Mindset Health e-Learning system, could enhance nurses' professional development in future (Polit & Beck, 2006:210). A single qualitative case study was chosen, because of the nature of the research was exploratory within a specific case, as supported by Yin (1994:284).

1.8 Division of chapters

Chapter One: Introduction, problem statement and clarification of the concept of e-Learning

Chapter Two: Theories and application of e-Learning

Chapter Three: Professional development of nurses

Chapter Four: Empirical research, analysis and interpretation of data

Chapter Five: Summary, recommendations and conclusion
1.9 Summary

In this chapter the researcher introduced and contextualised this research. The concept of e-Learning was clarified and a definition of e-Learning, in the context of this study, was derived. A brief description of the research methodology was presented.

In the following two chapters, prior to embarking on the empirical research activity, the researcher reviews the literature in order to formulate an understanding of the broader context of this research. While interacting with the literature, the researcher will analyse previous research outcomes, outline the broader context of this research and refine the research questions.
Chapter Two
Theories and Application of e-Learning

'Theory allows us to see the big picture'
(Anderson & Elloumi, 2004:33)

2.1 Introduction

The above statement suggests that theories permit us to see the holistic or gestalt picture of a subject discipline. It suggests that, like in any other subject field, the theories on e-Learning will assist us to form a better understanding of the context of e-Learning.

Since e-Learning is part of a bigger picture of education, theories for e-Learning are embedded in the broader educational theories. Therefore this discussion is based on the broader and known theories underpinning teaching and learning. These would include the behaviouristic, cognitive, humanistic, and social-constructivistic learning theories. The reason for selecting these broad clusters of theoretical underpinnings emanates from the fact that they represent the core principles and facets of education. In this regard the researcher can speak of personal experience. The researcher designed diagrams to map out the discussions that will follow. Below is a diagram that summarises the learning theories relating to e-Learning in this research:
2.2 Theories of e-Learning

In this section the theories as per figure 2.1 are discussed as well as their influence pertaining to the context of this research. Core concepts of each theory will be highlighted and explained in the broader teaching and learning context. The researcher will also emphasise personal experiences in nursing education throughout these discussions, while integrating e-Learning as part of a teaching and learning method.

2.2.1 Behaviourism

This learning theory is based on the behaviourist psychological theory. Important concepts in this theory emanate from Ivan Pavlov’s classical conditioning experiments, as well as Skinner’s operant conditioning experiments (Louw & Edwards, 2005:226). Although Pavlov’s classical conditioning experiments form the foundation of this theory, Watson is seen as the father of behaviourism (Louw and Edwards, 2005:229). These authors are of the opinion that Watson refined behaviourism, as is discussed further in this research.
A core concept being derived from these experiments is the stimulus-response process. Another concept is reinforcement, also known as the rewarding concept. Deduced from this school of psychology, behaviour, can be learned or changed by a frequent repetition, bringing about a certain response (Louw & Edwards, 2005:226). For example, the dogs in the experiment associated the bell (conditioned stimulus) with the food (unconditioned stimulus) and started salivating (response) when they heard the bell.

In the researcher's experience the same system is followed in the school system of South Africa, where the learners hear the bell (conditioned stimulus) and they move to a next classroom (response) for a lesson (unconditioned stimulus) on their timetable. The behaviour of organising their learning programme is facilitated through this system. Learners, at the end of the academic year, progress in their learning; which is the reinforcement they receive for the patterned behaviour in attending school.

According to Louw and Edwards (2005:230) learning can be encouraged through stimulus-response and reinforcement. Hamachek (1995:243) elaborates that reinforcement can be positive, where the learner is rewarded, e.g. when progressing to the next grade / level, or negative, where the learner is punished, e.g. when remaining in the same grade / level.

Results after an assessment are regarded as a form of reinforcement. Therefore assessment is one of the most significant factors that influence a student's progress in a course (Young & Patterson, 2007:91). This implies that learners require constant feedback to motivate their progress in learning. Anderson (2004:38) affirms the previous and asserts that these assessments ought to be formative and conclusive in nature.

Schunk (1996:50) concludes by stating that learning is centred in behavioural change. Therefore learning solely takes place when there is a change in the behaviour of the learner.
Further application in a teaching and learning situation of the behaviouristic theory focuses mostly on the reinforcement of operant behaviours (Hamachek, 1995:244). An example of reinforcing operant behaviour is when the educator focuses on an acceptable behaviour of the learner, rather than unacceptable behaviour. Whenever the learner exhibits the desired behaviour, the educator will acknowledge it. This acknowledgement of behaviour results in repetition and the more the learner repeats the better he / she becomes in the preferred behaviour, until it is mastered, which, according to Schunk (1996:50), portrays learning, because there is a change in behaviour.

When applied to nursing education, the researcher noted in his experience as a nurse educator the positive reinforcement of professional behaviour during health assessment. The nurse educator would acknowledge it when the nurse learner maintains professional, caring boundaries, while doing a health assessment on a patient, e.g. telling the patient what he / she is doing and why the examination is necessary, rather than merely examining without acknowledging the patient’s discomfort. In the absence of such professional conduct the nurse educator would immediately leave the context where the nurse learner does not adhere to the previous criteria, which should be seen as negative reinforcement to eliminate the unwanted behaviour. This interaction should alert the nurse learner to always explain to patients during health assessments.

In clinical nursing, which is a human behavioural science, the application seems easy, but the way in which this theory is applied in e-Learning, is discussed below.

**Application of behaviourism in e-Learning**

Although this is seen as one of the basic learning theories, Hamachek (1995:252) describes e-Learning in this context as reinforcement without the physical presence of teachers. This author is of the opinion that the instruction can be designed in such a manner that reinforcing a correct response depicts a basic principle in e-Learning instruction, which forms part of learning.
Linking to the previous is the immediate feedback through computer-sounds in an e-Learning context, where the learner completes electronic assessments on a computer (Pont, 1996:45). An example is the programmed computer-sounds during learning assessments when the learner chooses the correct answer, e.g. 'clapping of hands', and for the incorrect answer the sound, 'ooh!'. The learner immediately associates these sounds with the result and either proceeds, or retries. In other words there is a stimulus-response process being programmed in the e-Learning programme.

From behaviouristic theory the learning of the principles of stimulating learning by sound or movement, as well as the reinforcement through immediate feedback, can bring about the response of encouragement to progress with an e-Learning programme.

2.2.2 Cognitivism

Cognitivists, like Köhler, Tolman and other gestalt psychologists, are of the opinion that the organisation of information is a far more complex process than association, as described by behavioural psychologists (Louw & Edwards, 2005:258).

Pont (1996:47) further asserts that these processes are inherent in the use of existing knowledge in order to understand, analyse, reflect, memorise, retrieve and make sense of new knowledge. During these processes the learner forms new knowledge by solving an existing problem. Louw and Edwards (2005:257) continue by pointing out that cognitive learning takes place when there is a change in cognition, e.g. thoughts, ideas and beliefs. It is therefore evident that, unlike behaviourism, during cognitive learning, information is processed and organised, which is not necessarily reflected in overt behavioural change. The main thoughts in this theory focus on the processes of learning, for example problem solving, analysing, or decision making. In summary it can be said that the cognitive learning theory emphasises problem-solving skills.
In the broader context of learning, theorists, like Bandura (as quoted by Schunk, 1996:108), is of the opinion that learning takes place through a triadic reciprocality model, where the person's behaviour is influenced by the environment, meaning that the cognitive views of people are shaped by their social environment. This kind of cognitive learning infers that internal information processing is transformed into action, or changed into activity (Schunk, 1996:109). According to Anderson (2004:260) learning cannot take place without considering the critical social component. Anderson further states that through supporting and challenging each other, learners gain and create new knowledge collaboratively.

Tolman (as quoted by Louw & Edwards, 2005:260) discovered cognitive maps for learning, that explicitly emphasise ‘mapping out the problem’ in order to resolve it. Anderson (2004:37) affirms that learning cannot take place in a vacuum, but that it is earthed in a specific knowledge domain, hence personifying the gestalt of learning.

In a teaching and learning context cognitive learning theories are often used in complex problem-solving cases. The educator poses a problem to the learners and provides them with guidelines to solve the problem. The learners in return use their environment, lateral thinking and insight to map out the problem in order to resolve it (Louw and Edwards, 2005:262).

In nursing education cognitive learning theories are normally used to facilitate diagnostic skills among nurse learners. Learners are given a patient, or a case study with diverse problems, in order to establish a nursing diagnosis. Learners therefore deploy the different premises in cognitive learning theories to arrive at a diagnosis in order to prescribe nursing care.

**Application of cognitivism in e-Learning**

Although e-Learning mostly presents limitless opportunities to explore knowledge, it is important that the learning facilitator provides the learners with the bigger picture (gestalt). This is accomplished by scaffolding learning
activities, so that the learners can develop into their own discipline-centred discoveries (Anderson, 2004:37).

Moule (2006:370) concurs with Anderson and further asserts that e-Learners can develop essential characteristics of communities of practice, namely mutual engagements, shared repertoire, group participation and collaboration, to develop cognitive learning skills.

2.2.3 Humanism

Hamachek (1995:26) states that the central ideas of the humanistic theory are based on Maslow's theory on the human hierarchy of needs. Concepts of importance from this theory are the positive aspects of the human being and motivation. Among others characteristics, the inner-directedness of people, which allows them to set self-directed goals, forms the core of this theory (Louw & Edwards, 2005:443). Maslow concurs with the views by Rogers, the father of humanism, that learning forms part of the self-concept of human beings (Hamachek, 1995:348).

According to the views mentioned directly above teaching and learning would imply the development of the self-identity. Expectations by the educator are to assist learners to develop specific skills, to point out learners' abilities and talents and to develop positive expectations in learners by believing that learners can do what is expected of them (Hamachek, 1995:349). This means that educators should motivate and support learners to develop their competence.

In nursing, as part of human sciences, the core concepts of humanism are centrally embedded in nursing education. Nursing curricula are generally based on Maslow's hierarchical needs. These humanistic principles are important to the educators, learners, as well as the patients.
Application of humanism in e-Learning

For e-Learning this theory concurs with the learner-centred perspective. According to the broader educational perspectives, learner-centred theories comprise that the educator take on the role of facilitator. The learner is the focal point, therefore learner involvement and active participation are imperative in the teaching and learning process (Young & Patterson, 2007:124). Anderson (2004:35) further states that in this theory the focus is on the learner who is a customer, receiving a service from the educator or facilitator. Anderson also corrects himself in this theory, which he rather views as learning-centred, in order to include the importance of the facilitator’s needs.

This theory also focuses on the pre-existing knowledge, as well as on the cultural overlay of the learner. Depending on the mode of e-Learning, this theory can be challenging to facilitators, as the tools and opportunities to discover learners’ preconceptions may be limited. However, evidence suggests that there can be significant social presence in e-Learning (Maule, 2006:370). Most challenges can be bridged if the facilitator consistently probes for the learners’ comfort and competence in the e-Learning process (Anderson, 2004:36-40).

Farrell (2006:15) is also of the opinion that most e-Learning approaches are learner-centred, because they put learners in charge of their education. Anderson (2005:1) further emphasises the importance of interaction and social presence in all forms of education, including e-Learning.

It is therefore clear that the underlying assumptions of the humanistic theory enhance the application of e-Learning.
2.2.4 Social constructivism

Piaget is seen as one of the theorists at the forefront of the development of social constructivism (Glasersfeld, 1998:23). The core assumption of social constructivist learning is that learners construct their own knowledge by making sense of what they experience. The last statement links to Vygotsky's work on social constructivism (Vygotsky & Ivic, 2000:2). Vygotsky & Ivic (2000:2) stated that learning is part of development and is embedded in human sociability, social interaction, culture and history. Hence Vygotsky, as a leading social psychologist, is of the opinion that learning is rooted in social relations (Vygotsky & Ivic, 2000:2). Stetsenko & Arievitch (1997:160) support Vygotsky and highlight three main principles underpinning social constructivism, namely that social constructivism emphasises social interaction, that it is a socially embedded process and that it is activity-driven.

Mayes and De Freitas (2009:16) affirm that the social constructivists are of the opinion that a learner actively constructs knowledge through achievement of understanding. Constructing knowledge depends on the previous experiences of learners as well as their existing knowledge. Therefore, what is pertinent in the constructivist theory is that the learners are actively involved in the construction of their own knowledge and meaning in a self-regulated manner (Mayes & de Freitas, 2009:16).

This leads to the basic assumption of social constructivism that learners construct or build most of what they learn and understand (Schunk, 1996:208), assuming that learning material is truly understood when learners rediscover knowledge within their own context. The learning responsibility therefore rests on learners. Premises of social constructivism rely on the different types of constructivism. According to Schunk (1996:210), there are the exogenous, who believe that the construction represents the reconstruction of the external world, whereas for the endogenous, knowledge is constructed from previously acquired knowledge, while the dialectical believe that knowledge is derived from interactions between people and their environment. Social constructivism is further seen as an active construction of
meaning and knowledge (De Muynck and Van der Walt (2006:14). The latter can be divided into individual constructivism, where an individual constructs his or her own meaning or worldview individually, compared to social constructivism where a learner constructs his or her own learning by making sense of what he or she experiences within a social learning context (De Muynck and Van der Walt, 2006:32).

According to this theory learners are responsible for their own learning, while the educator / facilitator creates a context of learning for the learner to construct his / her own knowledge. Hence, teaching and learning are seen as collective interactions between different stakeholders, with the focus of this research being that of social constructivism.

In terms of teaching and learning, constructivism answers the question: “How does a learner manage to acquire what goes by the name of knowledge?”, rather than, “What is knowledge?” (Larochelle et al., 1998:23).

Sequel to the previous constructivists, constructivist theorists are of the opinion that learners ought to construct their own knowledge (Schunk, 1996:209). For the teaching and learning environment it is important to realise that social constructivists challenge the other learning theorists on diverse ‘educational truths’, according to Pépin (as quoted by Larochelle et al., 1998:180). Examples of these beliefs challenge the traditional ‘didactic andragogy’, e.g. ‘Knowledge can be transmitted’, i.e. constructivists believe that knowledge is constructed and ‘Learners can accumulate knowledge for now and for the future’, in which case constructivists believe that knowledge is dynamic and learners need to be supported to construct new knowledge that will prepare them for life-long learning. In addition, most curricula in the South African context are reflecting competency-based, learner-centred, outcomes-based education, which are underpinned by social constructivist principles (De Muynck & Van der Walt, 2006:54; Gravett, 2006:19).

To conclude, life-long learning is important in nursing education, due to the dynamism of the health system. Most current teaching and learning models in
nursing education are deduced from social constructivism, in view of the experience by the researcher. It is evident in the example that information on HIV and AIDS was not included in the nursing curriculum fifteen years ago. Nursing graduates of fifteen years ago must equip themselves in order to care for patients in the current health system, being dominated by HIV-related illnesses.

**Application of social constructivism in e-Learning**

It is clear that e-Learning requires a qualitatively new pedagogy which is built on the unique relationship of the facilitator and the learners according to Huang (2002:27). This author emphasises that traditional one-way teaching and one-way televised learning has a somewhat ‘boring’ effect which is not conducive to social constructivist teaching and learning (Huang 2002:27). The three principles previously mentioned by Stetsenko & Arievitch (1997:160) are driving the learning in a social constructivist teaching and learning context.

Van der Westhuizen (2004:170) states that activities in e-Learning material must employ applicable social constructivist activities in order to facilitate constructivist learning. Such e-Learning activities include knowledge construction of electronic games, where learners modify or integrate new knowledge into prior knowledge in order to make sense and construe meaning, as well as collaborative learning, which is facilitated by synchronous e-Learning and reflective activities, where learners are offered an opportunity to articulate what they have learned in a group.

Perusing through the different theories of learning, it also became clear that the social constructivist theory portrays a creative synthesis of most learning theories, because it borrows from all the traditional theories, like humanism, where a learner’s opinion is respected in the learning context by constructing his / her own learning, and the reflection in cognitive theory, to name two examples. De Muynck and Van der Walt (2006:119) are of the opinion that the social constructivist theory is currently more popular in the teaching and learning context. This popularity therefore also influences the e-Learning
milieu. The following is a concept map, outlining the integration of e-Learning in teaching and learning.

![Integration of e-Learning](image)

**Figure 2.2: Map for the integration of e-Learning (designed by the researcher)**

### 2.3 Integration of e-Learning

This part of the research endeavours to describe a broad process of how e-Learning, as a method in teaching and learning, can be integrated. For e-Learning to be effectively integrated in teaching and learning, it would be necessary to understand the functioning of information and communication technology, to explore applicable models of e-Learning, as well as the strategies used in e-Learning. To follow is a discussion of the integration of e-Learning. In this discussion the concept of e-Learning builds upon the insight gained in Chapter one (see "Clarification of the concept of e-Learning" in chapter one).

#### 2.3.1 Information and communication technology systems

The tools used in e-Learning include all *Information Communication and Technology* tools, for example, computers, the internet, computer hardware
and software, television, radio, video, mobile phone and numerous other digital devices (Gauntlett, 2007:9).

In addition, the most important 'tool' of e-Learning is the educator, who facilitates learning in an e-Learning context (Gauntlett, 2007:9). An e-Learning educator must design the instructional material in such a manner that learning takes place, irrespective of the physical presence of the educator. Gauntlett (2007:8) confirms this notion by emphasising that e-Learning tools are exclusively there to support and enhance learning in a teaching and learning context.

2.3.2 Models of e-Learning

Mayes and Freitas (2009:4) affirm that there are no models of e-Learning, but rather e-enhancements of models of learning. The latter encapsulates the reasoning of most educators that e-Learning is a method to enhance or facilitate learning in a practical, instead of in a traditional, pedagogic way. Therefore three models, that would enhance learning in such a way, are described in this research. These models include (i) Salmon’s five-stage model of e-Learning, (ii) the Demand-driven learning model, and (i) Garrison and Anderson’s community of inquiry model (Gauntlett, 2007:12; Anderson, 2005:2; Engelbrecht, 2003:42). Salmon’s five stage model was chosen, because it illuminates the step-by-step development and facilitation of e-Learning, while the demand-driven model compliments Salmon’s five-stage model by adding a leg of employer cost-effectiveness, whereas the community of inquiry model facilitates a social aspect of e-Learning, which is important in the nursing profession, as established in surveys done by Mindset Health, stating that nurses learn better in a social context (Mindset, 2007:12).
Salmon’s five stage model for e-Learning
This model consists of five stages that describe the process of e-facilitation by highlighting the process of the learner, as well as the facilitators or e-moderators (Gauntlett, 2007:12). To compliment the dual process in this model, the importance of technical support is emphasised throughout the discussion.

Stage one focuses on the Access and Motivation of the learner (Gauntlett, 2007:12). This involves the prerequisites of and induction of learners to an e-Learning programme, according to Mayes and De Freitas (2009:36), meaning that it is essential that the learners have or acquire the skills for an e-Learning programme. Accordingly, the role of the facilitator would include induction activities, welcoming and encouraging the learner. Complementing the learner and facilitation processes, are the setting up and assessment of the systems by the technical experts and also the accessibility of systems and learning programmes. This stage is seen as a foundation and if it is not consolidated, the e-Learning process cannot proceed effectively.
Stage two emphasises e-Learning (online) socialisation. The learners establish their identities and locate others with whom they can interact. On the other hand the facilitators familiarise the learners with the process and support them to link culturally, socially and academically. From the technical side the operation of the system is important in order to send and receive messages (Gauntlett, 2007:12).

The second stage flows into the third stage, which is information exchange (Mayes & de Freitas, 2009:36). This is a sharing and supportive stage for the learners, where the facilitators enhance learning by providing the learners with e-activities and support them with the study material. System operations in searching and personalising software are important during this stage.

According to Mayes and De Freitas (2009:36), stage four facilitates knowledge construction through collaboration of the learners. This stage is enhanced by diverse teaching and learning facilitation methods to enhance collaborative learning, e.g. group discussions and conferencing.

Real reflection and development of the learners are presented in them achieving their goals in stage five. Facilitators support the learners in this stage to reach their goals and technically the operation of the system needs to be robust in order to achieve learning, e.g. a robust system on formative and summative assessments (Gauntlett, 2007:12).

An advantage of this model is the fact that it facilitates group learning as a method. Adding to the advantages of this model is the fact that it has a three-prong approach namely, that it focuses on the learner, facilitator and the technical experts involvement during each stage. The equilibrium of the processes of these three participants facilitates learning. The model can also be seen as a step-by-step model, where the learner is motivated from one stage to the following, which can be beneficial to the nurse learner and facilitator when they move from a traditional face-to-face context to e-Learning.
Two disadvantages of this model are the fact that it is rigid in the sense that it does not really recognise individual learning (Gauntlett, 2007:13). However, it depends on the self-directedness of the learner, because if the learner is motivated, learning can take place individually.

![Diagram of Demand-driven model](image)

**Figure 2.4:** Demand-driven model (Engelbrecht, 2003:42).

**Demand-driven model**

This model is the product of a collaborative effort between educators, experts and private-public partnerships and was exclusively developed to enhance cost savings during e-Learning (Engelbrecht, 2003:42). It shows similarities to the previous model. As noted in the figure, the **superior structure** focuses on learner motivation and issues of access, like learning environment and pedagogical strategies. These are also seen as part of the foundation phase, as in the previous model. Following this foundation is the content, delivery and service, as highlighted in this model.
According to this model, the **content should be inclusive**, as well as real and evidence-based (Engelbrecht, 2003:42). This is where the in-depth practices of content development emanate from. A second requirement of this model is the fact that the **delivery's interface should be user-friendly**, which also includes the operations and the interface of the system. Lastly, this model proposes a learning **conducive service**, namely resources, administrative and technical support, accessibility, as well as responsiveness to the changing needs of learners, preceded by ongoing evaluation and continual adaptation and improvement of the model.

Adhering to these requirements will lead to the outcomes of the model, namely effective learning and lower cost to the employer.
Garrison and Anderson’s Community of Inquiry model
The community of inquiry model is similar to the previous models, because it also focuses on collaborative learning. However, according to Anderson (2005:2), this model defines a progressive e-Learning environment through three key components, namely:

The **cognitive presence**, which means that participants, or learners, in any context of learning of a community of inquiry, construct knowledge and meaning through continuous reflexive communication. This links to stages three and four in the previous discussion, where learners construct knowledge through discourse.

**Social presence** is the second component of this model, where learners project themselves as ‘real people with personal attributes’ in the community of inquiry. It links to stage two in the previous model, where the learner identifies himself or herself. The main aim of this model is to emphasise the role of social presence in the setting of an educational climate by virtue of
supportive discourse, in order to create an educational experience or learning opportunity.

The third component is the **teaching presence**. In this model it is described as the design, facilitation and direction of the cognitive and social processes to realise meaningful outcomes. The latter emulates teaching and learning in e-Learning. In the previous model (figure 2.5) this interaction is prescribed throughout the model.

A core advantage of this model is the fact that social presence facilitates collaborative learning. However, social presence is not only seen as the physical presence of participants online, but also of social software, which enhances this presence.

![Figure 2.6: Creative evaluation of the three models (designed by the researcher).](image)

In evaluating the three models, the researcher extracted core principles that are similar or that resonate. This was done in order to form a creative synthesis. Figures 2.3 and 2.5 show similarities that are embedded in the core principles being extracted from figure 2.4. Similarities from figures (2.3 and
2.5) are Teaching Presence and Information Exchange, meaning that in both models it is regarded as important to create a context where learning can be facilitated through information exchange.

Social presence links to the exchange of information, in the sense that there needs to be social ‘interaction’ in order for learners to exchange information. This is similar to Online socialisation. However, the learners need to have Access to e-Learning tools in order to socialise academically. Added to access is motivation, which comes from learner readiness, or internal motivation, or external motivation from other learners, or the facilitator. Another similar concept is cognitive presence that facilitates knowledge construction for effective learning to take place. These related concepts play an important role in e-Learning in order for learning to take place, but learning cannot take place without the relevant partnerships and collaboration, as highlighted by the demand-driven model.

Therefore knowledge construction takes place when there is ‘social interaction’ between teaching and between learning partners who have access to an e-Learning system.

2.4 Strategies of e-Learning

Before discussing the strategies, it is important to explore how learning takes place. Understanding the learning process makes it easier to appraise an e-Learning strategy.

According to the online-dictionary a strategy is defined as a plan, pattern of actions or method designed to achieve a goal (Online Dictionary, 2009). In this research the focus is on strategies for e-Learning and the strategies would therefore be designed to be related to teaching and learning plans or methodswhen making use of electronic media to achieve learning.
According to Hamacheck (1995:228), the learning process is defined within a specific learning theory as has been discussed previously. From a basic behaviouristic perspective, learning is seen as a process by which behaviour is either modified or changed through learning. From a more cognitive constructivist perspective, learning is seen as knowledge construction (Hamachek, 1995:231).

Gravett (2006:36) alludes to the fact that learners understand subject matter better when they appreciate learning. Gravett further asserts that learners learn more effectively when they question, analyse and re-organise coursework to construe meaning for themselves, which is in line with social constructivism. This implies that educators do a disservice to learners when they supply learners with ready-made summaries, as it is against the practice of social constructivism (Gravett & Geyser, 2004:36).

From this discussion it is clear that learning takes place during active participation of the learner, rather than through passive absorption of knowledge.

Another imperative aspect in the learning process is the different styles of learning. Hamacheck (1995:259) and Gravett (2006:31) identified three basic styles for adult-learning, namely visual, aural and physical. Visual learning is when learning is stimulated through sight, aural learning is facilitated through the hearing sense, or sound, whilst physical learning needs active involvement in the subject matter. Effective learning material should be based on the three styles of learning in order to facilitate learning. It is important to note that the strategies of e-Learning should consider the learning process and style of learners.

Strategies for e-Learning are further described by focusing on the planning of e-Learning, the interdisciplinary team required for e-Learning, the tools used for e-Learning, communication modes during e-Learning and the prerequisites for e-Learning.
2.4.1 Planning for an e-Learning strategy

Planning is seen as one of the core activities in making an e-Learning strategy work. Although there are different models according to which to plan an e-Learning strategy, one of the most widely used models is the Analyse, Design, Develop, Implement and Evaluate (ADDIE) model (Allen, 2006:38; Van der Westhuizen, 2004:162; Elloumi, 2004:75). The ADDIE model is discussed below.

**Analysing Phase**
During this phase the data are collected with a view to various aspects. Van der Westhuizen (2004:162) depicts three aspects, namely the in-depth assessment of the learners, as well as the learning coursework and outcomes. Although this author prioritises the learners' expectations, in practice this is a hugely neglected aspect. Most developers assume that they know what learners need, but this is and remains a debatable point. Basic needs of learners may include, *inter alia*, their technical skills to master the system, their style of learning, their present level of development and other important variables. Course work is normally managed effectively by developers of e-Learning programmes.

Allen (2006:38), on the other hand, has a more technological focus during analysis. He emphasises the analysis of the system to be used, identification of tasks, selection of tasks to train, the building of performance measures, the choice of instructional setting, as well as the estimated training costs. While these are important aspects, the main focus is on the technological advancements, that emphasise electronics, instead of learning.

Elloumi (2004:75) calls this action 'the analysis of inbound logistics', that includes the full preparation for course development, for example, curriculum planning and other related activities. These activities focus on the planning of instruction design before engaging in teaching and learning. Such activities are essential for composing an e-Learning programme.
Design phase

Van der Westhuizen (2004:164) both concur that the design focuses on the process of course development that would include the development of objectives, the identification of learning steps, the development of assessment methods, the list of entry behaviours and the sequence and structure outlays, e.g. learning management system. Elloumi calls this the operational phase, where the operations are designed using the data collected during the analysis phase (Elloumi, 2004:75). It is thus important that the analysis phase be done thoroughly for the design phase not to disintegrate, since these phases build upon each other.

Development phase

Allen (2006:38) is more explicit about the activities during the development phase. These actions include the analysis of an e-Learning system before implementation, the selection of a delivery system, review of external material, developing the instruction synthesis and validating the instruction. This is also seen as the management of outbound logistics, which includes the packaging and storage of courses.

Implementation phase

This is seen as the action phase where a management plan is developed and utilised and training is conducted to implement the e-Learning system. This phase is normally preceded by a pilot or trial phase, which is then improved before the e-Learning system is finally implemented.

Evaluation phase

According to Allen (2006:40), this includes internal evaluation, external evaluation and revision of the e-Learning system. During this phase it is important to involve the actual learners who are going to use the e-Learning system. The evaluation phase is applicable after every phase in this model. Although phases are discussed independently, they are interconnected and cyclic in order to keep an e-Learning system effective and relevant. The planning process is normally delivery-, cost- and time-bound.
Except for careful planning, the required prerequisites for embarking on e-Learning must be explored, as is discussed next.

2.4.2 Prerequisites for embarking on an e-Learning strategy

Van der Westhuizen (2004:177) describes this aspect under readiness for web-based learning. This author suggests that e-Learning should become strategic for higher education. This has already been accomplished by the passing of the e-Education Act in South Africa, according to which e-Learning can be made part of all educational institutions (South-Africa, 2003).

A next prerequisite is organisational change or institutional change. This change focuses on the expected adjustments within an organization when e-Learning is introduced. Though it is a challenging task, it becomes easier when preceded by an enactment. Currently, in South Africa, educational institutions have a limited choice when it comes to escaping e-Learning, because, according to the White Paper on e-Education, a certain percentage of learning will be forced to include e-Learning (SA, 2003). When educational institutions adhere to this necessity, employers who want to stay abreast with educational developments will be ready to follow suit. The cultures of both educators and learners are expected to change in this situation. This prerequisite is generally facilitated through consistent training and information provision (Gauntlett, 2007:12). Educators and learners feel more comfortable when they are adequately empowered.

Another requirement is continuous support of educators, learners and the e-Learning system (Gauntlett, 2007:12). Subsequently, this is one of the most important prerequisites to be built into an e-Learning strategy, because lack of support can bottleneck the process of learning. Being aware of the prerequisites, a logical question that might follow is: "Who are the participants involved in the multi-professional team behind the development of an e-Learning strategy?". The answer is discussed below.
2.4.3 Interdisciplinary team involved in the development of an e-Learning strategy

Cossu et al. (2006:46) propose a multi-professional team for the development of an e-Learning programme. This instructional design team may include different experts, namely subject-, education-, e-learning- and ICT-experts (Cossu et al., 2006:46). This means that if useful learning is envisaged in e-Learning, the strategy should include a selection of suitable team-players to plan for the purpose of efficient teaching that will result in effective learning.

The membership of this team would include senior management or sponsors, the e-Learning strategy or -planning director, the information technology specialists, the teaching and learning specialists, the e-Learning expert, the content or subject matter expert and a learner representation (Morrison, 2003:137). Some of the functions may be executed by more than one person, or one person may perform more than one function, depending on the e-Learning project.

The above practitioners, known as the instructional design team, are normally the team involved in the development and continuous support of an e-Learning programme.

2.4.4 Communication approaches for an e-Learning strategy

Wodecki (2006:82) states that e-Learning is divided into synchronous, asynchronous and hybrid, or blended modes. These are discussed below.

**Synchronous mode of communication**

A synchronous mode requires the simultaneous presence of the educator and learners on the e-Learning platform, e.g. conversations or discussions, tele-video conferencing, or DVDs (Wodecki, 2006:82). According to Driscoll (1997:7) the mode is synchronous when the learner and facilitator are online at the same time and the facilitator becomes the co-learner.
This mode is time-bound and space-bound and is also known as the virtual classroom. Comparing it with the traditional face-to-face teaching and learning context, the learners still need to communicate during the same time, although it will be virtual.

**Asynchronous mode**

An asynchronous mode does not require the simultaneous presence of educators and learners, e.g. e-mail, internet sources and interactive multimedia courses (Wodecki, 2006:82). According to Driscoll (1997:8), learners do not have to attend class at the same time, because each learner teaches himself or herself with the facilitator’s guidance. The facilitator may be physically present, or there can be a messaging system, linking the learner and facilitator.

The asynchronous mode is not bound to time and space and may be regarded as self-paced learning. This mode works very well when learners are goal-oriented and self-directed.

**Blended mode**

A blended or hybrid mode is a combination of a contact-/ e-Learning- and/or classroom course, that is augmented with a self-directed e-Learning module (Wodecki, 2006:82). Accordingly, Driscoll (1997:9) regards the blended mode as the most effective mode in facilitating learning in an e-Learning context, supportive of the view by Wodecki (2006:82). Blended learning can be regarded as a creative synthesis of traditional face-to-face learning modes and different e-Learning modes.

**2.4.5 Impeding factors in e-Learning**

E-Learning is seen as a method to facilitate teaching and learning and therefore has its own challenges as a mode of facilitation. Perusing the challenges around e-Learning, four main impeding factors emerged from the literature, namely (i) a lack of learner readiness and motivation, (ii) variation in
learner expectations concerning their training and support needs, (iii) the facilitator's strategies to meet the training and support needs and (iv) the lack of technical support to enhance the robust operations of the e-Learning system (Docherty & Sandu, 2006:344). Learner readiness focuses on the need of the learner to want to learn, or the internal motivation of the learner to want to learn. This links to the key elements of support, whether it is from the facilitator or from the technical team, in order to enhance the usage of an e-Learning system. All challenges need to be addressed in order to create a conducive context for learning, because they resonate with each other as stumbling blocks to e-Learning.

However, according to the discussion earlier of Salmon's five stage model, these challenges can be overcome (Gauntlett, 2007:12). An important strategy to manage the challenges of e-Learning, is the effective planning and preparation as discussed previously (see 2.4.1).

2.4.6 Facilitative factors in e-Learning

One of the facilitative factors is the fact that e-Learning opened another door for the facilitation of learning, according to Childs, et al. (2005:21). Anderson (2005:1) agrees and adds that e-Learning promotes opportunities and resources for teaching and learning.

Adding to these opportunities and resources are the transformation in the teaching and learning environment, where learners can be assisted with professional online help, as per Childs et al. (2005:21). This benefit promotes blended learning. Another advantage is the ubiquitous nature of e-Learning, which contributes in reaching the 'hard to reach' learners. The ubiquitous nature makes accessibility and continuous education possible in various contexts (Childs et al., 2005:21).

Anderson (2005:2) emphasises the cost-effectiveness when e-Learning is used in a pragmatic manner, instead of a pedagogic strategy. Pragmatic means that the focus is to reach more learners in challenging situations,
where learning would not take place under traditional circumstances. In most situations e-Learning, if well planned, might contribute to cost containment. However, this cost containment can be seen in the long run when e-Learning is integrated.

Where e-Learning is implemented the advantages outweigh the impeding factors, especially as there are effective ways of dealing with the latter should they emerge.

2.5 Summary

In this chapter it became evident that the four theories of learning that have been discussed, mostly overlap in an e-Learning context. This signifies that e-Learning does not have its own unique set of theories, but that it utilises general educational theories creatively in order to facilitate learning by means of ICT. These theories support both forms of e-Learning, namely individual and collaborative learning. Sequel to the forms of e-Learning, these theories can be utilised in the diverse communication modes of an e-Learning strategy. It is, however, important to first plan an e-Learning process before a theory for e-Learning is singled out, that is, if doing so is considered. The better approach would be for the course developer to proceed according to a creative synthesis of the discussed theories in order to be inclusive of all learning styles of e-Learners.

In addition, the application of e-Learning was also discussed in this chapter. Numerous challenges in e-Learning programmes, from conception to application, were emphasised. The literature review focused on creating a bigger picture for this research study. In the next chapter, the researcher endeavours the exploration of professional development in nursing.