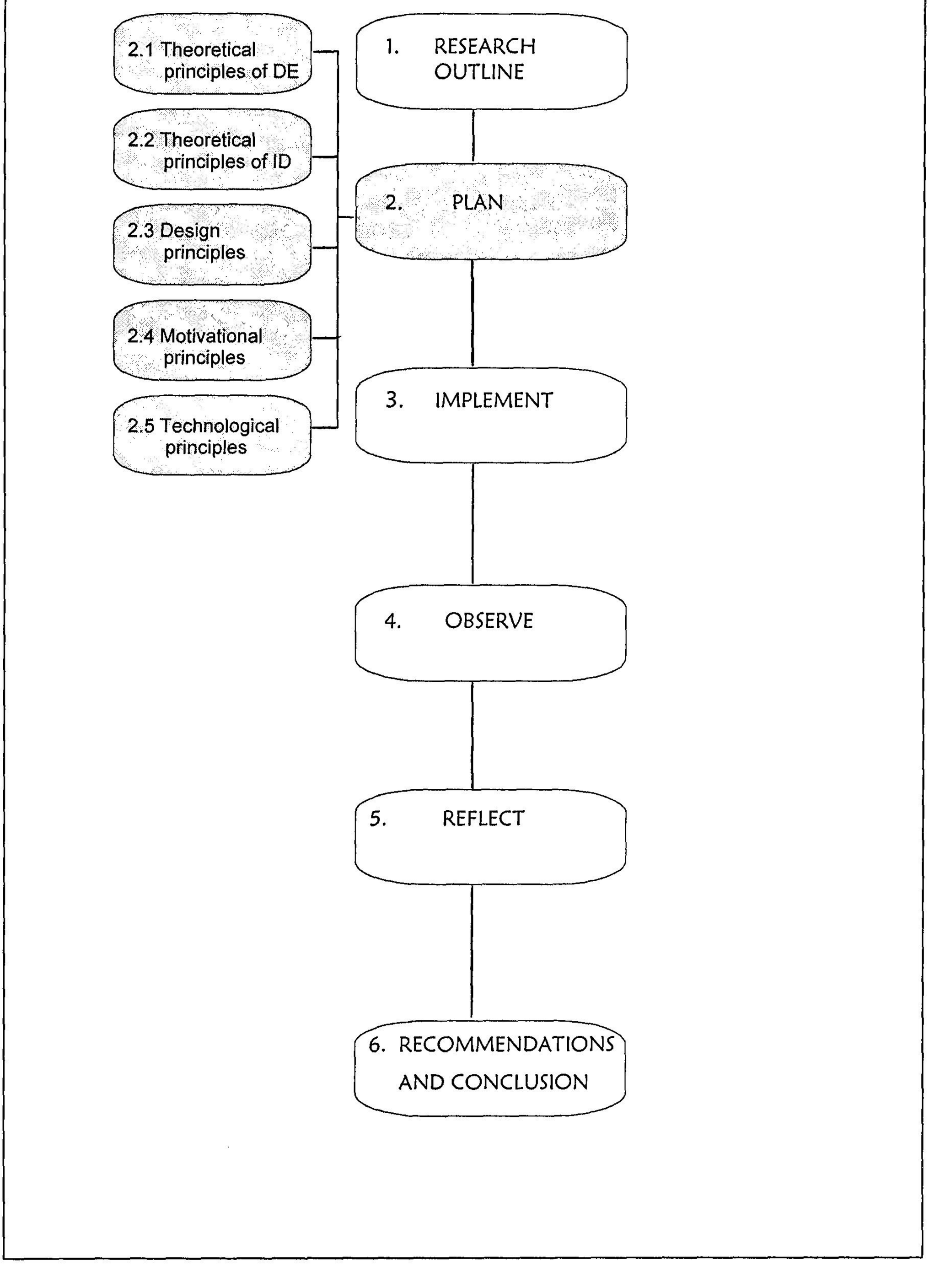
CHAPTER 2

PLAN



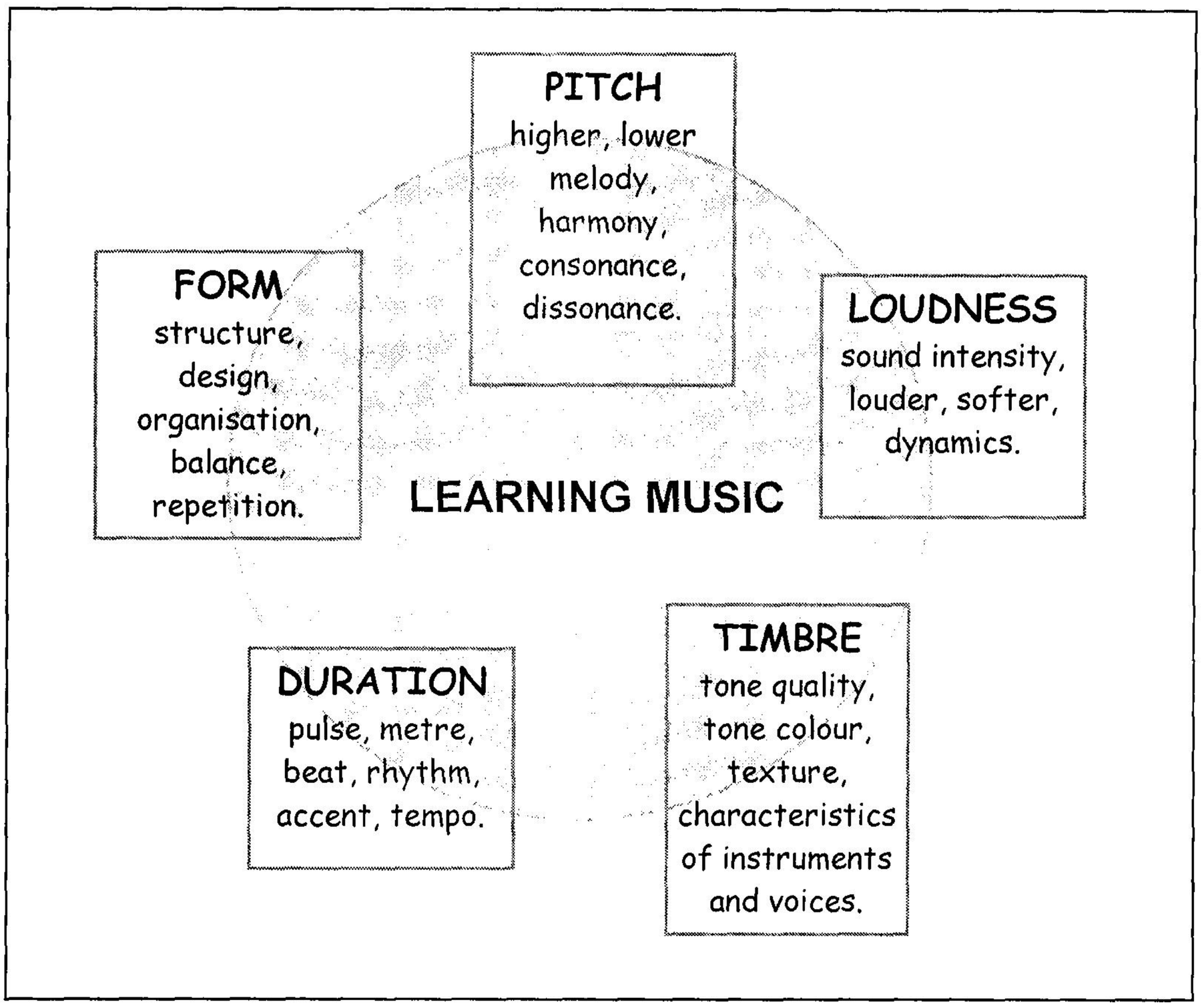
INTRODUCTION

This chapter explores the literature concerning the problem statement in Chapter 1 as:

What are the instructional design principles guiding the development of a distance Music Education programme?

Books and multimedia packages that deal with the history and theory of music and music appreciation are widely available. These books explain the historical and theoretical facts of music that can be learned off by heart. Learning takes place through reading and remembering. Music Education, however, is a subject that involves both factual and practical aspects. The factual aspects are referred to as music elements or concepts and the practical component as the skills used to demonstrate or experience them. Although much emphasis is placed upon the concepts and skills knowledge of world musics and the history of music is also considered to be important. The elements and concepts of music adapted from Andrews (1971:19-20) are highlighted in Figure 2.1.

FIGURE 2.1: Elements and concepts of music



The bold writing in Figure 2.1 indicates the elements of music. The elements give a basic description of the various components of the music by indicating that all music has elements of pitch, loudness, timbre, duration and form. The concepts written under each element expand the description of the music. The concepts specify in more detail what the characteristics of a particular piece are. The music does therefore not only have a certain loudness but can be described by indicating the intensity of the sound, the loudness or softness of the sound or the dynamics involved. Both concepts and elements are therefore present in the theoretical component of Music Education.

In order to gain understanding of the importance and use of these elements and concepts, music skills are employed. Learning is facilitated through a cycle of hear, do and see. Knowledge of the elements of music is facilitated through practical experience. The assumption can thus be made that the practical and factual components of Music Education are equally important and should not be separated.

Rowntree (1997:12) suggests that the didactic principles, method of assessment and equipment or facilities needed to perform the skills be defined in the planning and design of the learning material. The facilitation of the practical skills of Music Education over a distance needs to be addressed. Through a literature review the

- theoretical principles;
- design principles;
- motivational aspects; and the
- principles determining a selection of technological delivery modes, as stated in Chapter 1, will be discussed.

2.1 WHAT ARE THE THEORETICAL PRINCIPLES OF DISTANCE LEARNING?

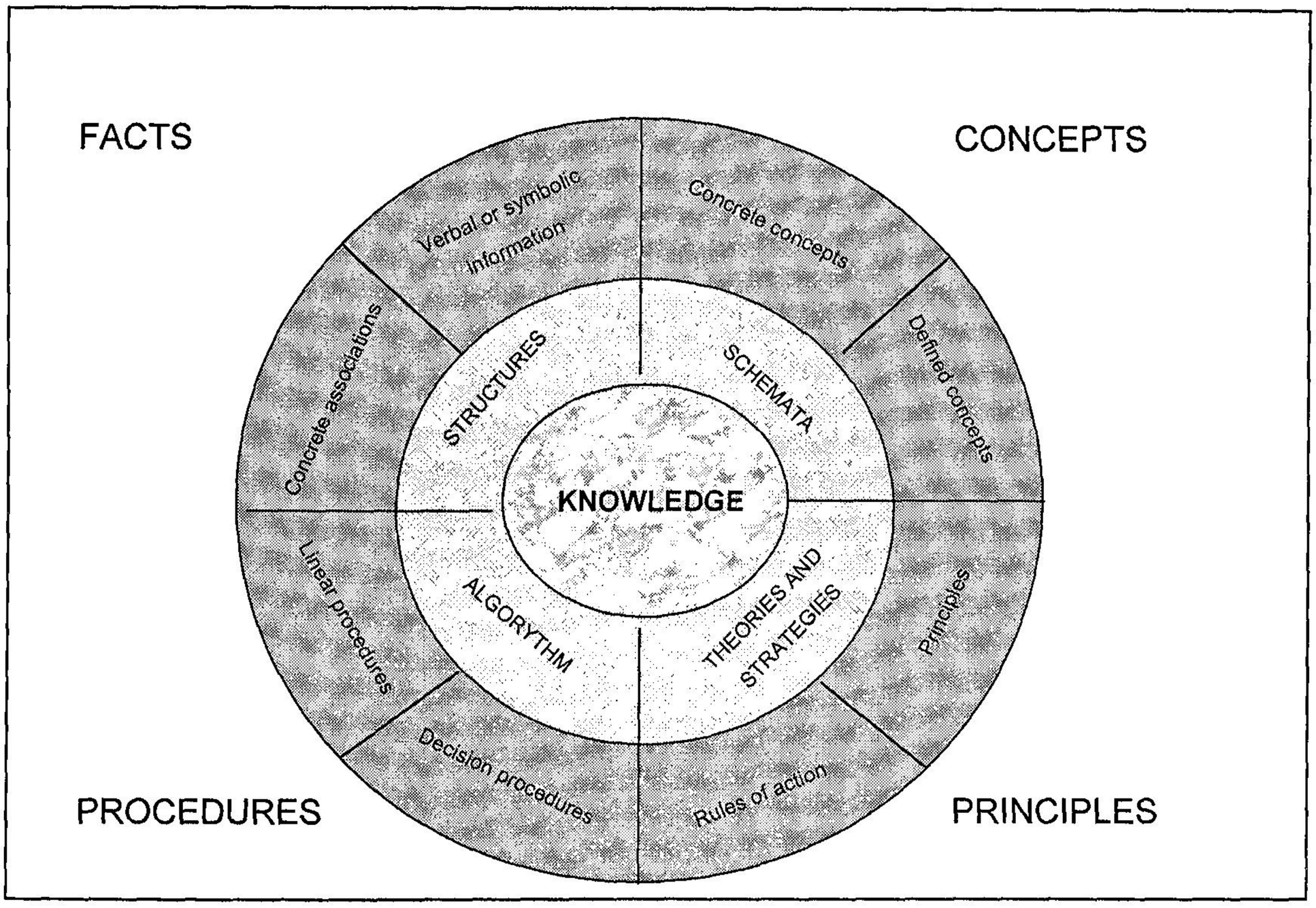
In order to facilitate effective distance learning, the instructional designer should be aware of different learning strategies. These strategies will enable the facilitator to design the learning material according to a heterogeneous learning population's needs and requirements.

2.1.1 Learning theories

Spector et al (1993:69) define a complete learning theory as one that describes stimuli (inputs), responses (outputs), performance mechanisms (rules for generic inputs from outputs), and the laws of learning (rules that specify how the performance mechanisms change with experience). An analysis of the individual's behaviour in different learning situations will provide the parameters of the learning theory.

Romiszowski (1984:58) states that learning can be divided into four strategies namely, facts, concepts, procedures and principles. These strategies highlight the process through which learning is constructed. Figure 2.2 demonstrates the interconnectedness of these categories.

FIGURE 2.2: Schema of learning (Romiszowski 1984:45)



Learning usually incorporates a number of outcomes. According to Romiszowski's (1984:45) research on learning behaviour the reaching of these outcomes can be achieved through making use of facts, concepts, procedures and principles.

- **Facts:** Most information is learned through facts. Facts are usually self-explanatory and do not need to be highlighted with examples. In the learning process, facts should be given so that learners can remember them.
- **Concepts:** To a large extent concepts can be experienced without verbal communication. Concepts are formed through repeated formulation and repetition of ideas and facts.
- **Procedures:** Procedures involve the methods through which associations and discriminations are formed. Through procedures learners can answer questions like: How do I do it?
- **Principles:** Like facts, principles can be learned through exploration and exposure. It is important that learners are given the opportunity to discover the principles.

Learning should not only focus on facts, but the learner should be guided to integrate the knowledge in different situations through well structured learning activities. 'Knowledge has to be abstracted and represented formally, in order to become generalised and therefore more generally useful' (Laurillard 1993:20).

Learners can only make knowledge their own when it is learned and applied. In order to understand the learning process, the methods by which learners study need to be stipulated. Learning involves the recognition as well as the self-discovery and/or application of facts. The ideal learning theory should therefore pay attention to the:

- **cognitive domain**: knowledge, thinking skills and understanding;
- **affective domain**: attitudes, values and personal qualities; as well as the
- **psychomotor domain**: experience, involvement and exploration of knowledge.

By incorporating these three domains learning can become holistic, involving the mind, body and soul of the learner. For the purpose of this research, the focus will be on the current most popular coexisting theories of learning, namely behaviourism and contructivism.

■ Behaviourism

The basic ideas of behaviourism are that 'human behaviour is a product of the stimulus-response interaction and that behaviour is modifiable' (Black 1995). Important role players in the definition of behaviourism are Pavlov (1949-1936), Watson (1878-1958) and Thorndike (1847-1949). These three behavioural psychologists experimented with the conditioning of behaviour. Behavioural psychology was further developed by Skinner (1904-1990). Skinner believed that the study of behaviour must rest on what organisms do and do not do. He concentrated on the observation and manipulation of behaviour. 'Let not the strong be cozened by **is** and **isn't**, **was** and **wasn't**. Truth's to be sought in **does** and **doesn't**' (Skinner in Black 1995).

The key elements of behavioural learning psychology can be summarised as follows.

- Learning is considered to be a **strategic process** of encoding and organising information for later use. Learning is an association between observable stimuli and observable responses. Behaviourists assume that the behaviour of learners is a response to their past and present environment and that all behaviour is learned (Black 1995).
- Learning can be defined as a **change in behaviour** as a result of experience. The learner should engage in a behaviour in order to learn and to validate that learning has occurred (Burns et al 1991:49). This will, only be possible if learners can determine their own rate and tempo of learning.
- Learning is **structured by the facilitator**. Since learning is a form of behaviour modification, the facilitator's responsibility is to structure an environment in which the correct behaviour of the student is reinforced. The outcome is to reinforce the learning process through an immediate response and the reward of getting it right (Black 1995).
- Learning is **passive**. In the behaviouristic approach, active involvement in the learning process is not regarded as a prerequisite for understanding. Understanding is regarded as a matter of seeing existing patterns. The teacher is the main role player in directing the learning process (Burton et al 1996:49).

Although the learner is classified as a passive entity who merely reacts to environmental stimuli, the learner must still engage in a behaviour in order to learn

and to validate that learning has occurred. Some activity or response is present (Burton et al 1996:49).

▪ Constructivism

The constructivist approach determines that learning occurs from the learners' perspective and educational background.

> The constructivist viewpoint emphasises that learning is the activity of the learner in interacting with alternative viewpoints and explanations, and with the surrounding reality. The process should be largely learner-driven and largely a process of collaboration and communication among learners. The role of the teacher, as teacher, is played down; the teacher's function is no longer the dissemination of information and the evaluation of students (Dills & Romiszowski 1997:xii).

Constructivism is based on Piaget's cognitive theory (Romiszowski 1986:37). Traditional constructivists emphasise individual thinking and the making of meaning. The new paradigm is that the learner is an active meaning maker. Knowledge is no longer 'out there' to be received but it is 'in here' in the mind and must be created anew by individuals for themselves (Nolte 1999b).

The key elements of constructivist learning psychology can be summarised as follows.

- Learning is a **strategic process**. The strategy indicates the method through which knowledge is acquired. Strategies are usually adaptable to a number of teaching environments. The learning strategy used can thus influence the outcome of the learning activity.
- Learning is focused on **motivation**. Through constructivism, learner enquiry, curiosity and initiative are modelled and developed. The learner gets the chance to discover information and to become involved in the learning process (Ashmul 1999).
- Learning is **holistic**. Constructivism is a holistic approach and less mechanical than original information-processing theories. 'Constructivist theories represent holistic approaches to education that see the process of acquiring new knowledge and understanding as firmly embedded in the social and emotional context in which learning takes place' (Seels 1995:179).

- Learning is an **active** process. Linear thinking is replaced by multiple perspective and reasoning outlooks (Seels 1995:139). The learner is actively involved in the learning process. The learners' will and purpose in the learning process is recognised.
- Learning is **contextualised**. Learning within the constructivist approach is related to our living and working environment. Learning can integrate and apply the information that they have acquired (Ashmul 1999).
- Learning becomes **personalised**. The role of the subject-specialist is to facilitate knowledge so that it can be applied by the learner in various circumstances (Seels 1995:49). The teacher plays the role of facilitator and makes the learning experience available to learners.
- Learning is **constructed by the learner.** Learning should be considered to be a personalised activity where the learners control the learning process, reflect on knowledge from their own perspective and adapt the information to their specific environment. 'The constructivist perspective on learning emphasises the notion that knowledge is something that a student constructs, using his pre-existing knowledge. It is not something a teacher somehow transfers into the student's head' (Riesbeck 1996:49).
- Learning is **active**. It is assumed that learners will have a better understanding of their learning environment if they discover and apply their knowledge to their individual environments.
- Learning is a **social activity**. Through co-operative learning, learners get the opportunity to work together with other learners, seeking information and answers related to their learning. Dialogue is encouraged between learners; as well as the facilitator and learners (Ashmul 1999).
- Learning is **time consuming**. The principles of lifelong learning are embedded in the constructivist philosophy. Learners need to be given the time to reflect on their knowledge and to mature in the learning process (Ashmul 1999).

The principles of cognitive learning can be outlined as the gathering of information and its personalisation. 'Constructivism's general tenet is that learning is a creative process, that knowledge is a personally constructed act instead of an objectively received state' (Seels 1995:238).

Learning theories therefore focus on the learner's perception of the learning experience and are based on the representation of information through the memory and cognitive activities (Spector et al 1993:47).

2.1.2 The learning experience

Both beginner and adult learners make use of obvious, linear thinking processes. They study information with a superficial vision without applying knowledge. In comparison, experts usually scan through information and use their prior knowledge to make interpretations. Both beginner and expert learners should be encouraged to involve meta-cognition processes in their learning. 'Meta-cognition is the ability to monitor one's own comprehension and control strategic processing' (Spector et al 1993:31). This includes distance education learners.

Marton & Säljö in Seels (1995:102) classify these learning approaches into surface and deep approaches. The approach refers to the way the learner sets out to tackle a particular learning task (Morgan 1995:55).

- **Surface approach learners**

Surface approach learners concentrate on the remembering of text and are characterised by a low interest in the course. Their intention is to complete the learning task requirements. They often experience high workloads and a lack of freedom in the learning environment. Biggs in Seels (1995:102-103) and Ramsden in Morgan (1995:56) summarise the characteristics of surface and deep approach learners as follows:

Surface approach learners

- see the task as a demand to be met, a necessary imposition if some other goal is to be reached (a qualification for instance);
- see the aspects or parts of the task as discrete and unrelated either to each other or other tasks;
- are worried about the time the task is taking;
- avoid personal or other meanings the task may have; and
- rely on memorisation, attempting to reproduce the surface aspects of the task (Biggs in Seels 1995:102-103).

According to (Morgan 1995:56) surface approach learners

- focus on the signs (the text itself);
- focus on discrete elements;
- fail to distinguish principles for evidence, new information from old; and
- treat learning tasks as an external imposition.

- **Deep approach learners**

Deep learning, on the other hand, focuses on the learner's understanding of the subject content. It is difficult to facilitate deep learning at a distance. The problem lies partly in the difficulty of helping learners to grasp the abstract concepts which underpin their understanding, and partly in the difficulty of devising reliable ways of assessing the extent to which they have grasped these key concepts (Sparkes 1992:144).

Deep approach learners

- are interested in the academic task and derive enjoyment from it;
- search for the meaning inherent in the task (the intention of the author);
- personalise the task, making it meaningful to their own experience and the real world;
- integrate aspects or parts of the task into a whole, see relationships between the whole and previous knowledge;
- try to theorise about the task;
- focus on the author's arguments;
- relate and distinguish new ideas and previous knowledge; and
- organise and structure content (Biggs in Seels 1995:102-103).

Research has shown that the surface approach prevents learners from achieving deep learning outcomes (Morgan 1995:58). Learners should be encouraged to develop their deep learning skills. In order to achieve this, attention should be given to learning theories and specific learning techniques as for, e.g., meta-cognition.

▪ Meta-cognition

When information is processed, both the working and long-term memory are employed. In order to store information the working memory, that has a limited capacity, requires active involvement in the learning process. The information is then stored in the long-term memory which has an unlimited capacity for information and does not require active knowledge intake (Polson 1993:7). When new information is learned, a mental structure is formed, elaborated and tested until a satisfactory structure of understanding is achieved (Perkins 1996:x).

This result is referred to as meta-cognition. 'Meta-cognition is a loosely defined concept that refers to the awareness and recognition of one's own cognitive processes. In other words, meta-cognitive awareness means that learners are thinking about the effectiveness of the learning strategies they are using during learning activities' (Flavell in Wilson 1996:71). Meta-cognitive methods are, applied to monitor understanding and problem-solving, to plan future processing and to focus attention on problem learning areas. 'By engaging learners in using knowledge, modelling problem-solving processes, and coaching learners in self-questioning and other meta-cognitive skills, the teacher helps the student to take control of the learning process' (Seels 1995:180). By involving these processes, the gap between beginner and expert learners can be narrowed (Spector et al 1993:31).

The focus of the learning process should be on the outcomes of the learning process. 'Learners use their existing knowledge to determine if a new conception is intelligible (knowing what it means), plausible (believing it is true), and fruitful (finding it is useful). If the new conceptions have these three qualities, then it is easily accepted by the learner' (Da Silva 1998:11).

From these learning strategies it can be assumed that the facilitator's focus should be shifted from learner performance to the various methods of learning that will enable the student to grasp and apply the knowledge recently acquired (Sparkes 1992:134). Figure 2.3 aims to summarise the learning experience.

FIGURE 2.3: Key elements of learning (Morgan 1995:62)

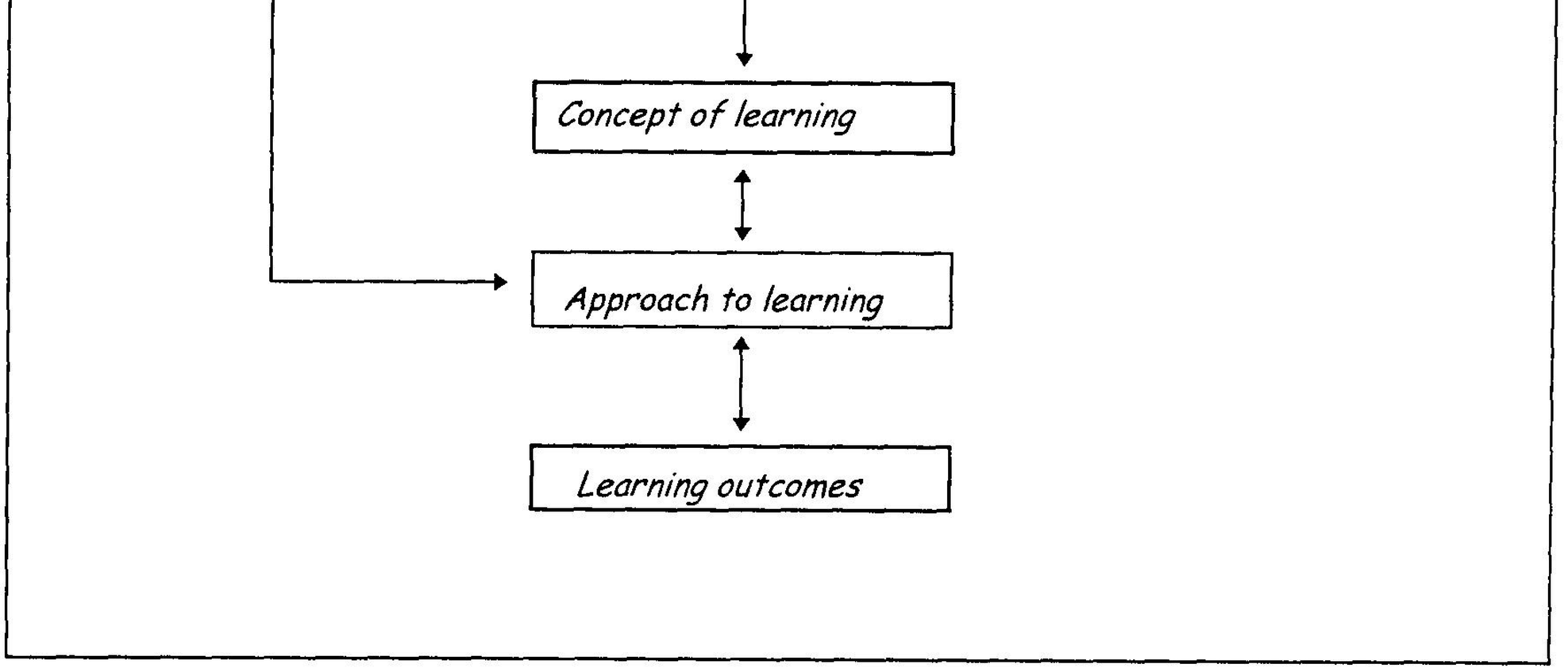


Figure 2.3 summarises the key elements of learning as an activity and draws together the key issues that influence the quality of learning outcomes. One such issue is the learning environment in which learning takes place.

> Distance education differs from conventional education in needs and structure. New forms of administration and management are needed to fulfil the needs of the new learner. Distance education learners are of different ages and at different stages of their lives. It can thus be assumed that these learners have diverse learning expectations and that the whole nature of learning changes (Ortner et al 1992:31).

For the purpose of this research the focus will be on distance learning. Distance learning can, however, best be understood if it is compared to contact or traditional teaching.

2.1.3 Distance education compared to contact education

Peters (1992:33) describes the difference between contact and distance education as a number of structural shifts. The differences are highlighted in Table 2.1.

TABLE 2.1: Difference between contact and distance education

Parameter	Contact education	Distance education	Implications
Learners	Adolescent.	Adult.	Didactical change.
Learner population	Traditional learners.	New learners.	Increased learner numbers.
Academic institution	Local and regional framework.	National and international framework.	Decentralisation of learning institute.
Teaching strategy	Vocational and/or professional training.	Continuing education for various career prospects.	Life-long learning.
Learning strategy	Group learning.	Self-instruction.	Independent learners.
Media selection	Oral delivery.	Mediated delivery.	Multi-media / multi-sensory presentations.

Table 2.1 highlights the difference between contact and distance education in view of the parameters and implications it has on the learning process. According to Sewart et al (1983:14), these differences also impact on the teaching strategy employed in distance learning. New teaching strategies should therefore be considered. Sewart et al (1983:14) explains that in distance teaching the:

- facilitator cannot see the learner's reaction to the learning material;
- effectiveness of the teaching depends on the application of media;
- facilitator is not aware of the learners` experience of the learning material;
- motivation of learners is very important because of the lack of face-to-face contact;
- management systems are based on industrialised systems; and the
- teacher should facilitate active involvement in the learning process. The focus should be on interaction. Three types of interaction are present in distance learning:

- learner-content interaction
- learner-instructor interaction and
- learner-learner interaction (Moore & Kearsley 1996:126).

The drafting of self-instructional learning material, usually for distance teaching, encourages the learner to be actively involved in the learning process. Regular communication between facilitator and learner is therefore facilitated. The flexibility concerning time and place of study enables learners to become lifelong participants in the learning process. These principles of distance education are embedded in the theories of distance education.

2.1.4 Distance education theories

In formulating a distance education theory, the philosophy of education and theories of communication need to be taken into consideration (Peraton 1983:34). The theories under discussion are the:

- theory of industrialisation;
- theory of independent study; and the
- guided didactic conversation theory.

- **Theory of industrialisation**

Peters (1983:95-113) compares distance education to the industrial and technological changes of the early Seventies. He found that the principles of industrial production could be applied in the design of distance education programmes. These principles include design, division of labour, mass production, automation, standardisation and quality control.

The principles of industrialised production can be successfully facilitated to help with the planning and maintenance of distance education programmes. The application of the principles of a production process can be adapted to distance teaching by dividing labour and by automating the design process.

> Distance study is a rationalised method - involving the definition of labour - of providing knowledge which as a result of applying the principles of industrial organisation as well as the extensive use of technology, thus facilitating the reproduction of objective teaching activity in any numbers, allows a large number of learners to participate in university study simultaneously, regardless of their place of residence and occupation (Moore 1983:111).

- **Theory of independent study**

Wedemeyer in Moore & Kearsley (1996:199) defines distance education as being learner-centred where interactivity with a tutor plays an important role. Wedemeyer`s research is referred to as *transactional distance education*. The principles of the transactional theory are as follows:

- All learners experience the learning process differently and should be regarded as individuals within the learning process.
- Effective learning is an experimental process. Knowledge is gained through experience.
- In order to keep up with the technological and educational changes, lifelong learning should be facilitated (Moore 1983:69).

This transactional theory is similar to the theory of Dewey which describes it in more detail.

> The transaction that we call distance education is the interplay between people who are teachers and learners, in environments that have the special characteristic of being separated from one another, and a consequent set of special teaching and learning behaviours (Moore & Kearsley 1996:200).

Whenever a teacher and learner are interacting from a distance, a lack of communication might be present. This communication gap is referred to as a transactional distance.

> The role of the teacher in the new learner centred educational universe, at its simplest, is not so much to *instruct* as to provide an environment in which each individual learner is able to identify what he is ready to learn, and in which he has access to a large variety of resources for learning. Author's italics. (Moore 1983:69).

In a distance learning programme the teacher becomes a facilitator who leads the learner through the learning process. Although the facilitator is absent, the learner can be motivated to become independent. Another form of communication should be found.

- **Guided didactic conversation theory**

Holmberg (1983:114) formulated the guided didactic *conversation* or *communication* theory. 'Education is based on communication'. The conversation is conducted by the learning material which should be compiled in such a manner that active participation from the learner is facilitated. The learner should be given the opportunity to study information and to apply this information to his/her environment and educational background. 'Effective internalisation of the complete learning conversation produces the self-organised learner and the fully functioning man or woman. Such people learn from experience and continue to learn from life' (Holmberg 1983:115). The communication referred to includes two-way communication between the learner and facilitator. Holmberg (1983:115-116) explains how two-way communication can be facilitated.

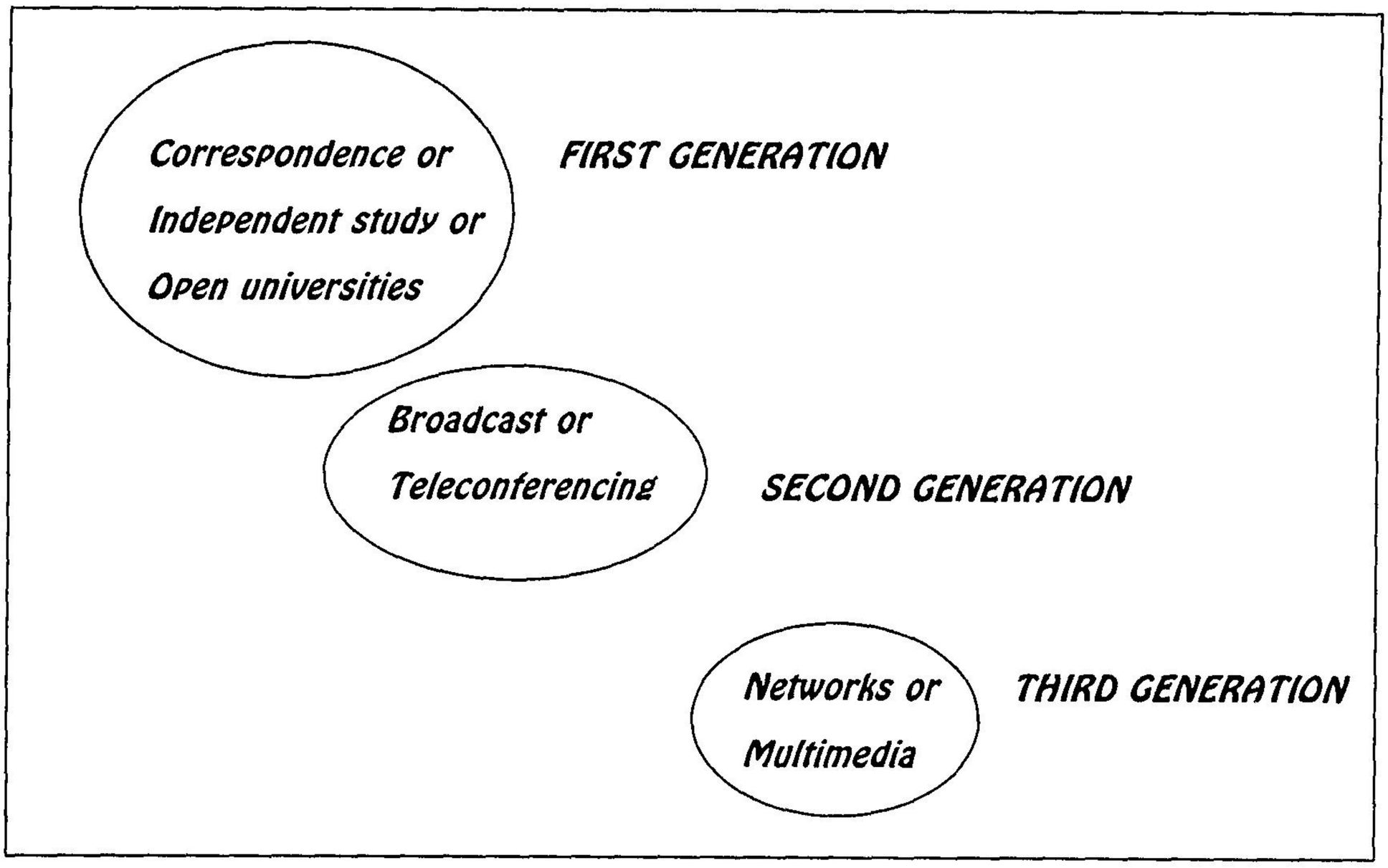
- Study pleasure and motivation is promoted by sharing personal relations. The facilitator should build a personal relationship with the learner.
- The facilitator should explain self-instructional material and the use thereof. Learners will then be confident to use the designed distance programme.
- Learners should be introduced and motivated to use the proper study methods and to reach learning outcomes.
- The selecting of the correct media is an important consideration in distance education. One should remember that the media is the facilitator's conversation support.
- Thorough planning of the learning process will promote study success (Holmberg 1983:115-116).

In currently used distance education models a combination of the above mentioned theories could be employed. These three theories can be considered to be a chain, of which each is a link in the learning process and are facilitated through a selection of distance education models.

2.1.5 Distance education models

Distance education is classified according to the delivery mode used in the presentation of the learning materials. These delivery modes are referred to as three generations of distance education. Figure 2.4 illustrates these three generations as they are given by Moore & Kearsley (1996:20).

FIGURE 2.4: The evolution of distance education (Moore & Kearsley 1996:20)



- **First generation distance education**

This is generally referred to as correspondence or single media education. Originally text, sound recordings and supplementary readings were used to complete questionnaires. This developed into the use of printed learning materials in the form of study guides with written assignments.

▪ Second generation distance education

Second generation distance education developed with the establishment of open universities. A total systems or multimedia approach was established as a mode of delivery. Correspondence material is used in combination with recorded media, for example sound and video cassettes. This generation is characterised by high implementation costs concerning the design and compilation of materials.

▪ Third generation distance education

This generation is also referred to as tele-education. Interactive television, telephones and computers and multimedia work stations are used as delivery mode. The inclusion of computers in the learning process makes increased two-way communication between learner and facilitator possible. These courses do not have high implementation costs and money can thus be spent on the designing of products to fulfil individual learners` requirements (Bates 1991:10).

In later development the focus shifted from the mode of delivery to the influence the distance has on the instruction, learners, communication and the interaction between the curriculum and its management. This resulted in different levels and models for distance learning.

In order to understand the principles of distance learning, Mark in Moore & Kearsley (1996:2-4) distinguishes between four levels of distance learning namely:

- distance learning programmes;
- distance learning units;
- distance learning institutions; and
- distance learning consortia.

▪ Distance learning programmes

This term is used to indicate activities taking place in a conventional university, college or school. Teaching is done through traditional classroom methods. Video-conferencing is used to involve learners, who are not on campus, in the classroom. The learning process is usually co-ordinated by one facilitator.

- **Distance learning units**

A distance learning unit is a separate department within a conventional college, university or school. Such a unit's key focus is on distance education and incorporates a separate administrative function.

- **Distance learning institutions**

These institutions specialise in distance education. The administrative and faculty functions differ from traditional institutions.

- **Distance learning consortia**

A consortium is a collaboration of two or more distance education institutions involved in the same delivery programme.

A variety of education models exists, enabling facilitators to design the learning material so as to fit in with learner and curricula needs.

> The potential and actual variety in possible teaching approaches and educational models is one of the major advantages of many conventional educational institutions, allowing teachers to flexibly adjust their methods to the particular context in which they are working, and to the changing characteristics of learners and their needs (Rumble 1986:25).

The focus is thereby shifted from the developed structure or model to the student and his/her learning environment. This enables the facilitator to design a learning programme to cater for learners' specific needs. The distance education models can be used as a guidance structure by the facilitator. Bertrand in Rumble (1986:24) divides distance education models into three basic categories:

- **Institution-centred models**

These models were compiled to enhance the efficiency of educational systems in order to be able to cope with mass education. Behavioural learning approaches that involve the processing, storage and retrieval of information are classified under this model. Many distance education projects in the formal education sector make use of the instruction centred model.

- **Person-centred models**

Such models analyse education from a humanitarian point of view. The focus is on individual growth and personal significance of the learning experience. The learner is considered to be an individual consumer. Learner requirements are handled personally by a mentor. The learning content is predetermined but the learner decides on the tempo and sequence of learning. Because of the use of tutors to monitor and evaluate individual performance, this model can only be applied where small numbers of learners are involved.

- **Society-centred models**

These models aim to bring changes to social structures. With this mode, the institution takes responsibility for the compiling of learning outcomes, learning content and assignments. The compilation of the learning material is done by academics who have little or no interest in the learners` needs. The learners are considered to be passive recipients of knowledge. The minimum communication between learner and facilitator is present because the model is compiled for mass education. Escotet in Rumble (1986:32) has argued that such a system is primarily a means of instruction and not of education.

In a successful distance education programme learners are viewed as independent and responsible for their own learning. The design of a distance education programme should therefore be based on a selection or combination of distance education models.

2.1.6 Planning of distance education models

The outcome of a distance education design is to facilitate quality teaching over a distance. In quality distance education the different components are planned in conjunction with one another. According to Sibanda (1995:129), quality distance education depends on:

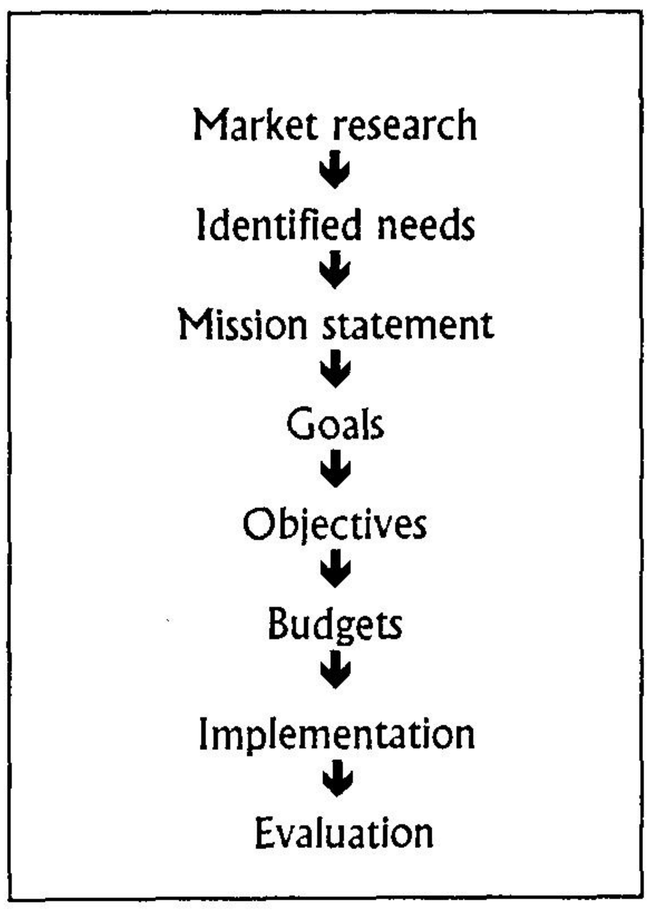
- an institution preparing material and support;
- learners who want to study;
- two-way communication between learner and facilitator;
- flexibility in time frames for completing the course;

- interactive and relevant learning material; and
- the encouraged use of a number of media.

By making use of industrialised planning and management principles, learning materials can be compiled to suit the needs of the individual or independent learner. The management of distance education programmes includes a number of evaluation phases. These phases include the formulation of a vision and mission and the compiling of learning outcomes and learning programmes. This includes an evaluation of expectations and available resources, learner demands, availability of technologies and projecting future resource and financial needs. Budgeting, scheduling and quality assessment should be planned and managed according to the information recorded in the evaluation phase (Moore & Kearsley 1996:172).

Market research is the first step of the planning process. The research should involve a study determining who your clients are and the identification of their needs. With these needs in mind, a mission statement should be compiled, underlining the outcomes of the instruction and learning programme. Before implementation, a budget should be drawn up to determine if these goals can be achieved. After implementation, the process should be evaluated and the necessary changes made. Figure 2.5 represents the planning process of a distance education model.

FIGURE 2.5: Planning a distance education model (Rumble 1986:86)



Only if all these phases are planned and successfully managed can a successful distance education system be established. The facilitator needs to be knowledgeable

about management skills when a distance course is being planned. This will enable the facilitator to set the administrative structures in place as the course is developing. This could result in a less troublesome implementation phase.

From the given information, one can deduce that the facilitator of a distance education course needs to be skilled in many aspects of the design and planning phases. Apart from these skills the facilitator also needs to be aware of instructional design theory so that a meaningfully designed course can be structured.

2.2 WHAT ARE THE THEORETICAL PRINCIPLES OF INSTRUCTIONAL DESIGN?

The principles involved in the design of instruction includes the selection of instructional design theories, models and the application of instructional design to distance education.

2.2.1 Instructional design theories

'Instructional theory, as a "linking science" between learning theory and educational practice, provides the growing but still incomplete knowledge base for prescribing the most appropriate instructional strategies and tactics' (Spector 1993:56). Greer (1980:22) describes theories of instruction as being directly or indirectly associated with learning principles and can be achieved through a systematic application of learning principles. Therefore, in order to formulate an instructional design theory, the instructional designer should be knowledgeable about the learning process.

Instructional design practices are usually divided into four generations. The content, pros and cons of each generation will be explained in order to select the most appropriate system for the design of a distance Music Education programme.

First generation instructional design organises the learning process according to known learning behaviours. In first generation instructional design, a step-by-step linear sequence is followed. Four step-by-step components can be identified:

- preparing behavioural objectives;
- preparing a pre-test;
- producing an instructional product; and
- preparing a post-test (Seels 1995:117).

First generation instructional design is evaluated through a formative evaluation system derived from action research methodology. A number of limitations were recognised in first generation instructional design. According to Spector et al (1993:149) these limitations include:

- the fragmentation of learning content;
- a lack of integration between concepts and skills;
- the facilitation of passive rather than active learning processes; and
- modular learning sequences rather than a spiral of learning.

The general development in the field of technology had an impact on the variables and conditions of instructional design. As a result a **second generation** instructional strategy was compiled. The pedagogical prescriptions of the second generation approach include the:

- establishment of learning outcomes;
- analyses of the target population;
- review and selection of existing materials;
- selection of instructional delivery system;
- solving of issues associated with implementation (Seels 1995:117);
- integration of knowledge and skills associated with the learning process; and
- organisation and evaluation of a learning sequence (Spector et al 1993:171).

These pedagogical prescriptions include the identification of instructional outcomes. In second generation instructional design, behavioural learning paradigms are still present. The focus is, however, directed upon the development of instruction independent of a subject expert. In this generation, the subject-expert and technician are considered to be a team. To document effectiveness, summative evaluation was added. This instructional system still needed to be revised because the second generation principles were not adaptable to specific problem situations.

In **third generation** instructional design, the subject-specialist and technician are replaced by an instructional designer. The reason for doing so is that instructional designers can control information and systems to scrutinise specific application needs. A linear system between the four basic phases of assessment, design, production and implementation is maintained. Feasibility and formative evaluation are added to improve front-end analyses and the shelf-life of developed products (Seels 1995:119). In the third generation of instructional design the design process is dependent on the instructional designer. As learning strategies continue to influence instructional design, the need for yet another generation arises.

In **fourth generation** instructional design, a problem-solving procedure is followed. The author or subject-specialist becomes an instructional designer. Situational evaluation is utilised and performs the function of diagnosing problem situations. Fourth generation instructional design can thus be adjusted as conditions over time change. The fourth generation model identifies two components (Seels 1995:121):

- a situational evaluation component; and
- a knowledge base component.

- **Situational evaluation component**

Fourth generation instructional design is based on a situational evaluation or diagnosis of prescribed activities. The learning environment or situation is diagnosed and authoring activities are then assembled. The furtherance of the authoring activities depends on the author's knowledge of instructional design. In Table 2.2 the instructional tasks at hand are indicated as concepts while the actions to complete the concepts are given as authoring activities. By completing the activities the outcomes or concepts of the instructional design process can be reached.

TABLE 2.2: Situational evaluation components (Seels 1995:122)

CONCEPTS	AUTHORING ACTIVITIES
1. Analyse needs and problems	• Identify discrepancies between desired and actual learning. • Determine consequences of learning discrepancies.
2. Analyse constraints and resources	• Identify the scope of the problem. • Define the constraints restricting resolution of need/problem. This includes variables or risk management.
3. Analyse target population	• Determine learner characteristics: educational background, age, ability, need for motivation, present skill level, number of learners, geographical location and culture. • Determine learner differences: cognitive style, learning style, affective factors, motivation and perception.
4. Propose solution plan	• Validate the situational diagnosis. Consider whether to: buy or use existing materials, modify materials, or develop new materials. • Estimate costs and resource requirements for each alternative.

In contrast to the previous generations, the authoring activities of fourth generation instructional design are described as areas of concepts neutral to any predetermined instructional sequence. The concepts are consequently represented as clusters. The five domains of the knowledge base component use the same labels as the other three generations. These labels as indicated by Seels (1995:125) include:

- analysis;
- design;
- production;
- implementation; and
- maintenance.

The instructional implications of these five domains to the design process are:

- **Analysis domain**

In the analysis domain, the foundational aspects of the learning environment are established. The aspects identified in the analysis influence each aspect of the instructional design process. The following aspects need to be analysed and/or determined:

- learning environment;
- learner characteristics;
- available resources;
- learning outcomes;
- delivery system;
- macro and micro information structures;
- entry requirements; and the
- sequence of information.

- **Design domain**

The design domain involves the:

- definition of the task to be learned at curriculum level;
- sequencing and organisation of information according to course, module and lesson;
- identification of instructional strategies;
- selection and display of characters, colour and graphics used;
- selection of human factors such as menus, function keys and prompts; and
- establishment of learning assessment criteria.

- **Production domain**

The production domain incorporates the activities directly associated with the actual development of the learning environment. In most instructional design situations, this domain would require the most time, effort and money to develop. The production activities include the:

- revision of subject content for accuracy and completeness;
- packaging of all necessary media so as to be implemented in the learning environment;

- preparation of management systems including the drafting of letters and documentation; and
- preparation of the product prototype. This prototype should be evaluated on a try-out basis and should then be revised according to the feedback received.

- **Implementation domain**

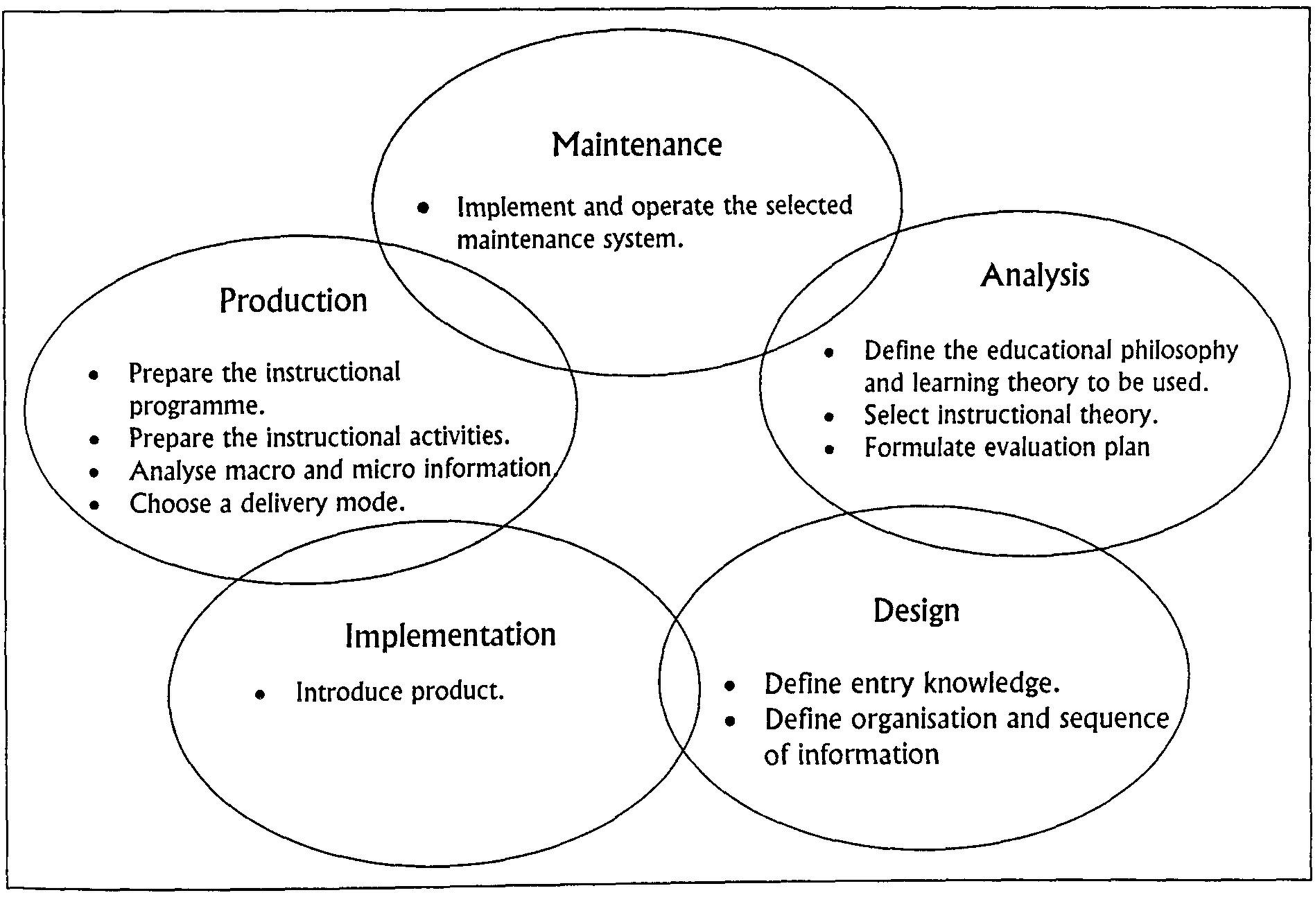
This domain provides the means for the instructional products to be put into operation. The implementation involves the:

- establishment of support services; and
- evaluation of the product according to cost and time.

- **Maintenance domain**

The maintenance domain provides the means for quality control of the entire learning environment. The outcome is to keep the product at the same level of effectiveness as when it was implemented. Figure 2.6 adapted from Seels (1995:122) illustrates the interrelationship between the various parameters of the knowledge base component.

FIGURE 2.6: Knowledge base component



These five domains are inter-linked so as to highlight their cumulative importance. Each circle or link to the design approach is equally important. Successful design will only be possible if all domains are handled uniformly.

At present all four levels of instructional design could be utilised in design. A collaboration of the different generations is often used to ensure that the best possible design is selected. These selected strategies are then compiled to form models of instructional design.

2.2.2 Instructional design models

Distance education requires special course design and instructional techniques, special methods of communication by electronic or other means and special organisational and administrative arrangements (Moore & Kearsley 1996:146). Facilitators should remember that they have no direct contact with the learner and should be very clear in their directions. The design of detailed, quality learning material is a prerequisite for successful learning to take place. Evans (1995:131) highlights the importance of quality study material by referring to the impact the learning material has on the learning process of the individual, often isolated learner.

> Open and distance learners have to make complex educational decisions, if not exactly in the dark, certainly in the gloom of speculation, interpretation, extrapolation and guesswork! Then, if these decisions are in error in some way, this often can only be discovered when it is too late as assignments come in or evaluation sheets are returned (Evans 1995:131).

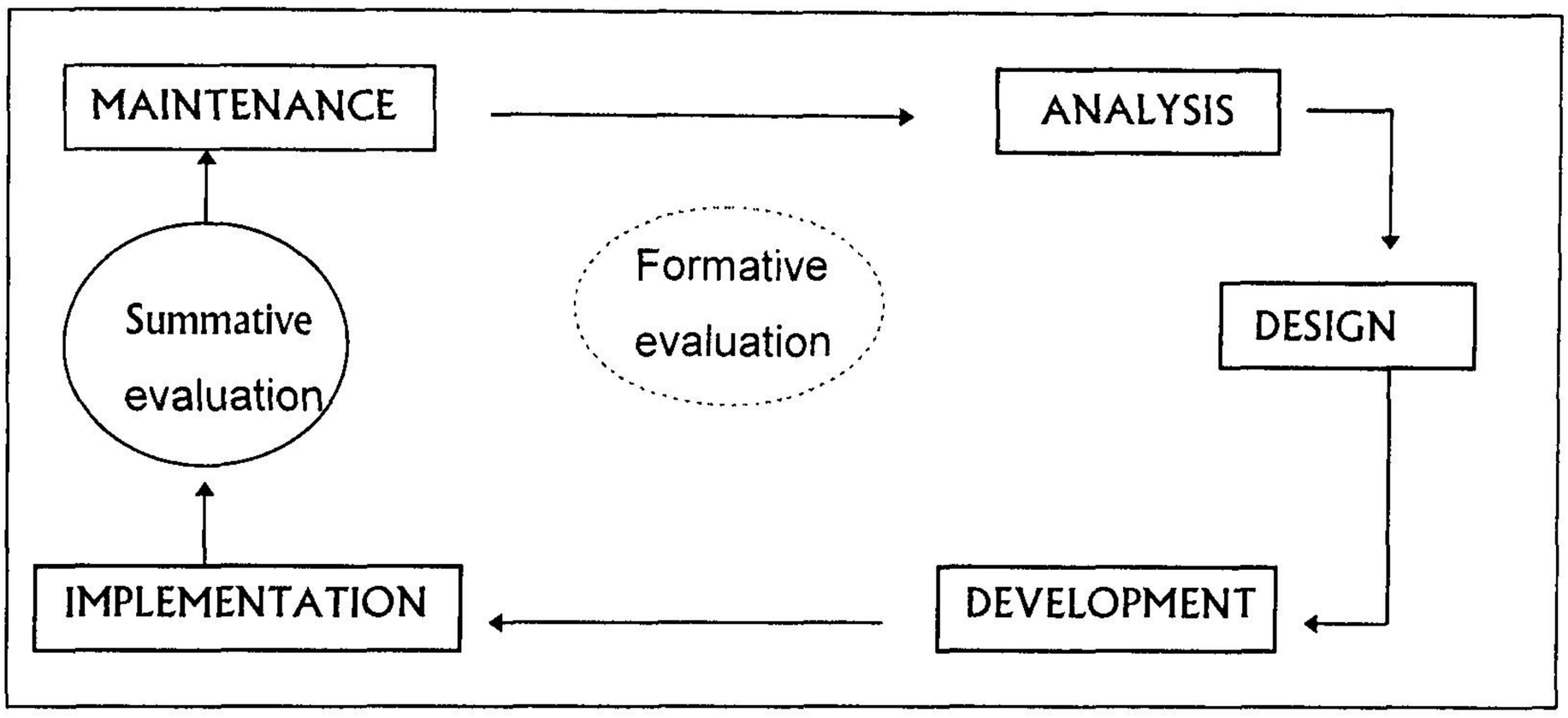
In order to determine the composition of quality instructional design, the parameters of quality control should be evaluated. According to Spector et al (1993:ix), instructional design models are usually based on the:

- learner characteristics;
- project analysis;
- instructional design requirements;
- formulation of learning outcomes;
- selection of instructional strategies;

- design and development of the project;
- conducted formative analysis; and
- maintenance of the instructional material.

Instructional design principles are applied through the systems approach to ensure quality distance education. Figure 2.7 explains the instructional process of the systems approach.

FIGURE 2.7: Systems approach (Moller 1999:4)



In the systems approach the different components of the design process are inter-linked but at the same time independent. This is the same principle as highlighted in the knowledge component of fourth generation instructional design. The systems approach describes a continuous design approach. Each aspect of the design cycle can recur. The formative evaluation circle has a dotted line to indicate that it is not a fixed structure at a specific time in the design. Formative evaluation is found at any stage of the design. The systems approach can therefore be effectively utilised in the design of distance education programmes.

2.2.3 Application of instructional design to distance education

Through the systems approach the role of the facilitator, instructional designer and use of media are defined. The instructional designer's role is to apply the theory of instructional design to the different aspects of the learning process. Table 2.3 illustrates the application of the principles of instructional design to a distance learning programme.

TABLE 2.3: Application of instructional design to distance education (Moore & Kearsley 1996:9)

Sources	*Design*	*Delivery*	*Interaction*	*Learning environment*
· Student needs	*· Instructional design*	*· Print*	*· Instructors*	*· Workplace*
· Organisations	*· Media*	*· Audio/Visual recordings*	*· Tutors*	*· Home*
· Theory/history	*· Programme*	*· Radio/TV*	*· Counsellors*	*· Classroom*
· Philosophy	*· Evaluation*	*· Audio conferencing*	*· Administrative staff*	*· Learning centre*
		· Video conferencing	*· Other learners*	
		· Computer networks		

- **Sources**

The sources include the knowledge and skills that need to be taught. Decisions are made according to the educational outcomes and learning philosophy of the learning programme.

- **Design**

A spectrum of design expertise is needed when incorporating technology and media into the learning process. The most efficient medium of instruction and method of evaluation should be selected and adapted to the learner's requirements.

- **Delivery**

Two-way communication should be facilitated throughout the learning process. This should involve the selection of media and technologies. Media is the information that is being sent by means of technology. Media, thus, includes printed text and pictures whilst technology refers to the machines used to make information accessible.

- **Interaction - the role of the instructor**

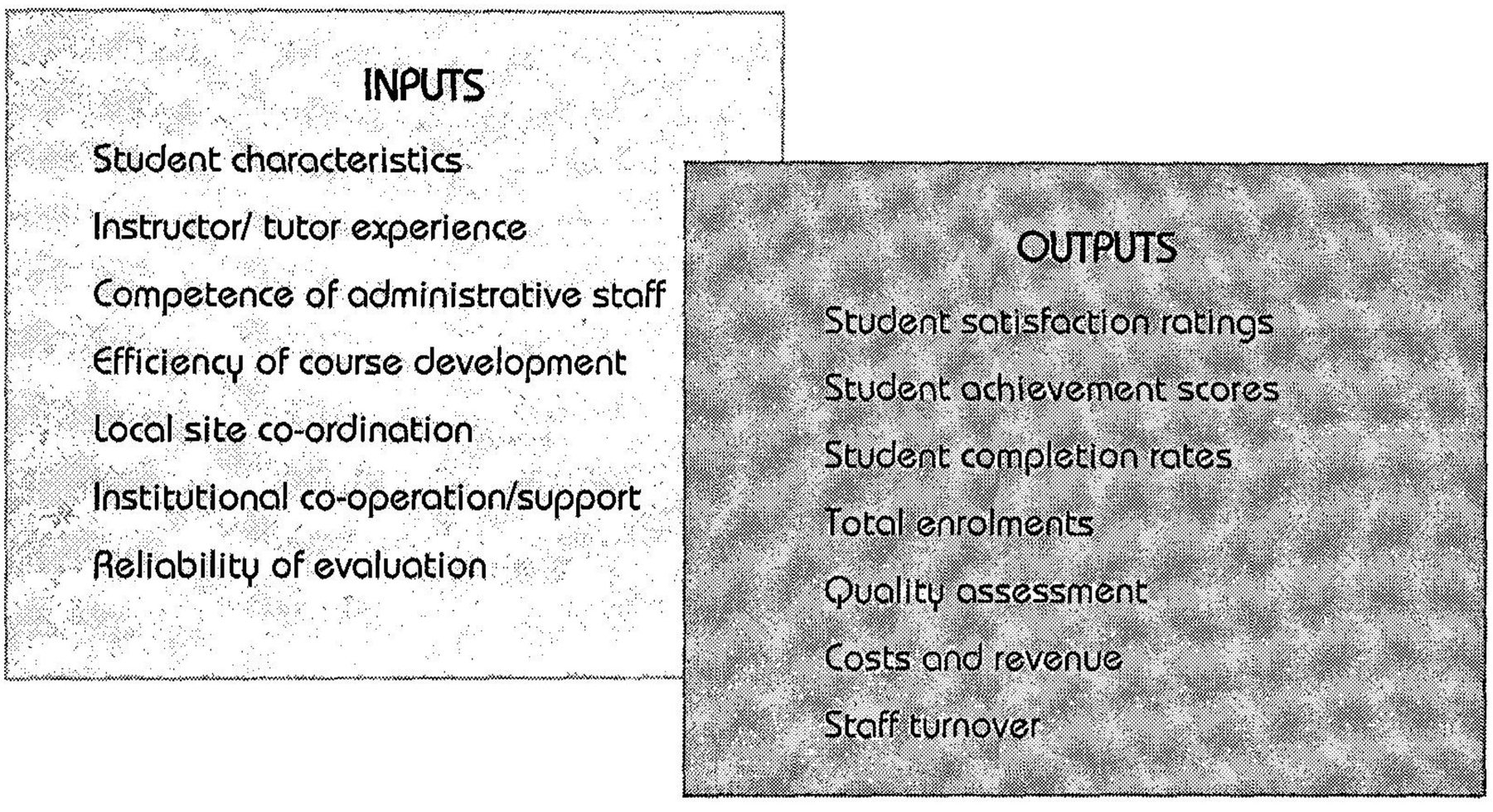
For learning to take place, sufficient communication and interaction between learner and facilitator are necessary. The nature and extent of the interaction is determined by the organisation's teaching philosophy, the age and skills of learners as well as the media employed in the course.

- **Learning environment**

This involves the place where and time in which learners are involved in the learning process. The learner must accept the responsibility of acting as a distance learner.

These aspects are important for a designed system to function as a distance education programme. An efficient system would require these aspects to be interrelated and independent. The success of an instructionally developed system is thus determined by the inputs and outputs of distance education learning as illustrated in Figure 2.8.

FIGURE 2.8: Inputs and outputs of distance education (Moore & Kearsley 1996:15)



By matching the inputs with the required outputs, a satisfying system and thus a productive distance education course can be compiled. The planning of a distance education system is of the utmost importance to ensure that the outputs are reached. The inputs and outputs should be predetermined by the course designer.

When the design sequence is planned the instructional designer should aim to answer the following questions (Romiszowski 1984:53):

- *When* should unit sequences occur?
- *How* the strategies, methods and tactics should be applied?

- *Who* is going to use the structure?
- *With what* media is the information going to be portrayed?
- *How well* are the test and control mechanisms designed?

For a design project to be successful the facilitator and designer should combine their knowledge and expertise. Traditionally the facilitator is considered to be less important than the instructional designer. However, it is in fact imperative that they are partners in a joint venture of design. For this joint venture to be successful, the subject specialist and designer should both be facilitators of the course. The key to success in this area lies, not in a grand design born out of ideology and self-interest, but in a personal, low-key, small scale approach, which is situation-specific and adaptive to context (Meacham 1993:60).

Parer (1993:45) suggests that the principles of instructional design should be applied to the specific needs of the course. Each course should be analysed in order to determine what the best instructional model is. A completed design model cannot easily be applied to another course seeing that the teaching environment, learner population and content of the course may differ. The facilitator should remember that existing instructional design models were compiled for specific subjects and teaching environments. These models can, however, be used as examples. 'What is apparent is that new models need to be developed or existing models need to be adapted to better meet the needs of today's teachers and learners' (Olson 1995:52).

According to Seels (1995:144), an instructional model can only be effective if two critical functions are combined to form a workable methodology. These functions are: **effective creative design** and **efficient management**. The measurement of these two parameters might not be easily identifiable. Formative and summative evaluation is used to determine the effectiveness of the instructional strategies.

The two phases of evaluation, as suggested by the systems approach, are common to instructional strategies. Formative evaluation occurs throughout the design process. This enables the facilitator to test and revise the programme whilst it is still being developed. Summative evaluation is used after the programme is implemented. The results from the summative and formative evaluation are used to maintain the standard of the designed programme.

Apart from these two evaluative systems, other forms of assessment are used to determine the success of a designed programme. Kamau (1993:200-201) suggests the following checklist for assessing the learning programme. The programme should be assessed according to the given criteria.

- **Outcomes:** Will the stated outcomes facilitate the correct behaviour from learners?
- **Motivational devices:** Is the difficulty of the self-assessment tasks in line with the learners` capabilities?
- **Language:** Is the language used understandable?
- **Assessment:** Are the assessment activities clearly defined? and
- **Content outline:** Is the sequence of information logical? Are there adequate examples to explain the theory?

The outcomes of the evaluation process are to identify and solve problems. When suggestions of improvement are given, they should be clearly documented for later reference. Each section of the learning programme should be evaluated. By doing so, a developmental spiral plan can be followed.

> Instructional design refers to a set of procedures to guide authors on the evaluation, analysis, design, production and implementation of learning environments. Attributes defined in instructional development models are supported by a diverse set of characteristics; system structure, evaluation activities, learning theory, instructional development process, author content and instructional design expertise and authoring activities. Foundations for instructional design models are offered by descriptive theories of learning and prescriptive theories of instruction (Seels 1995:113).

By evaluating each section of the designed programme, the instructional designer is aware of the necessary changes that should be made in order to facilitate effective learning within a particular field of study.

2.3 WHAT ARE THE INSTRUCTIONAL DESIGN PRINCIPLES FOR DISTANCE MUSIC EDUCATION PROGRAMMES?

The two most prominent groups of role players in the design process are the learners and instructional designer(s). The instructional designer has to have some background information concerning the distance learner in order to facilitate successful learning strategies.

2.3.1 Distance learners

The target receivers of distance education are traditionally adult learners with social, work and family responsibilities who strive to further themselves personally in their spare time. A second group of learners are beginning to enrol at distance education institutions. These learners are interested in individual courses as part of a degree or curricula-based conventional studies (Holmberg 1995:50).

Learning from a distance usually takes place in isolation. The learner decides on the time and place for studying. This is referred to as independent or individual study.

> Independent study consists of various forms of teaching-learning in which teachers and learners carry out their essential tasks and responsibilities apart from one another, communicating in a variety of ways for the purpose of freeing internal learners from inappropriate class pacing or patterns, or providing external learners with opportunities to continue learning in their own environments, and of developing in all learners the capacity of carrying on self-directed learning (Moore & Kearsley 1996:24).

Moore & Kearsley (1996:154) give the following three reasons why adults embark on a distance education course. Adult learners:

- have a desire to expand their knowledge and expertise;
- volunteer to further their education; and
- need practical experience and application of knowledge.

The difference between contact and distance education has been discussed in this chapter. From Table 2.1 it can be deduced that not only a structural change but also

a didactical change becomes apparent in distance learning. In order to facilitate a successful learning sequence, the facilitator should be knowledgeable about distance learners' requirements. Table 2.4 compares on- and off-campus learners' characteristics, the importance of learning stimuli and the identifiable learning distracters. The comparison will guide the designer in the design of a successful distance learning programme.

TABLE 2.4: Learning requirements of contact and distance learners (adapted from Oosthuizen 1997:70 and Hamilton 1994:123)

Parameters	On-campus	Off-campus
Learning stimuli	• tutorials. • seminars. • assignments. • personal motivation. • textbooks. • library resources. • lectures.	• study materials. • study schools. • assignments. • personal motivation. • textbooks. • library resources.
Learning distracters	• family. • friends. • finances.	• family. • friends. • work committees. • lack of contact with fellow learners.
Learner characteristics	• learning full time. • learner continues membership of learning institution. • learner is young. • learners have easy contact with fellow learners. • learner has access to institution's resources. • learner is in full-time contact with institution. • learner residence in close proximity to the institution.	• learning part-time. • learner returns to institution after absence. • adult learner. • learners don't have contact with fellow learners. • institution's resources not necessarily easily accessible. • infrequent contact with institution. • learning takes place across a distance.

From Table 2.4 one can reason that there are a number of resemblances between contact and distance learners. However, the differences should be specifically taken into consideration when a distance education programme is compiled.

Distance learners are expected to take full responsibility for their studying. By being actively involved in the learning process, adult learners get the opportunity to develop their organisational and decision making skills (Dills & Romiszowski 1997:393). Dills & Romiszowski (1997:396) further note a number of assumptions regarding the nature of adult learners, their principles of learning and the organisation of instruction. The assumptions are:

- Adults can and do learn significant things throughout their lives.
- Educational interventions ought to be organised so that growth and development are the ultimate outcomes.
- The potential of humans as learners can only be maximised when there is a deliberate interaction between three elements: the learning process, learning needs and interests, and available instructional resources.
- When given the opportunity, adults prefer to be in charge of their own learning and actually thrive under such conditions.
- Adults are capable of self-directed involvement in terms of personal commitment to and responsibility for learning, choice of learning approach, choice of learning resource, and choice of evaluation or validation techniques.
- An instructor's role is multi-dimensional, including being a facilitator, manager, resource guide, expert, friend, advocate, authority, coach and mentor.
- Empowering learners to take responsibility for their learning is the ultimate aim of education.
- Educational interventions ought to promote a match between the needs of each learner and the needs of the instructor.
- Teaching and learning excellence is the result of subject matter expertise, careful planning, a good deal of patience and flexibility, and a commitment to helping learners reach their full potential.
- The individualised instructional process can be utilised in nearly every educational endeavour with commensurate success.

The hypothesis can be made that learners experience learning diversely. The learning experience should thus be facilitated to fulfil the requirements of the individual learner.

2.3.2 Individualised instruction

The adult distance learner is involved in studying for the first time or often after a long absence. This results in a lack of confidence because of study skills becoming inadequate and also unfamiliarity with the study environment. The lack of confidence is enhanced by the degree of isolation in which the study takes place. The isolation is the result of the distance learner not having regular contact with other learners and/or the facilitator of the course. The learner therefore becomes an individual in the distance learning process.

The task of the instructional designer is to organise and structure the learning process so that the individual learner understands the material and becomes an active participant in the learning process. Successful distance learning can, however, only be facilitated if the degree of individualisation of the learning process and learner is determined. Four questions can be asked to determine if learning is individualised:

- What is to be individualised?
- When will the course adapt to the individual?
- Who decides?
- How does the system adapt to the individual?

- **What is to be individualised?**

Most individualised learning programmes direct the learner to take responsibility for at least part of the learning process. The learner should be given the opportunity to make important decisions concerning the learning process. By doing so, learning becomes individualised. The characteristics which may be individualised include:

- preferred pace of study;
- choice of media and materials;
- learning methods;
- alternative and supplementary learning materials;
- proposed learning outcomes; and
- preferred time of study.

- **When does individualisation take place?**

Individualisation can occur on many different levels within the learning process. These levels comprise the course, modules, learning outcomes and achievement of learning outcomes.

- **Who decides?**

The decision to individualise may be taken by:

- the learner when choosing a particular course option;
- the facilitator prescribing individual learning outcomes;
- the system which is designed to adapt to the needs of the individual learner; and
- the above mentioned parties as a joint conclusion.

- **How does the system adapt to the individual?**

The system adapts to the individual through the:

- style and format of the instructional material;
- media used;
- method of access as determined by the learner;
- role of the facilitator and tutor as medium of instruction; and
- medium used as management control (Romiszowski 1986:21-22).

Table 2.5 is a useful method of analysing and comparing existing systems of individualised instruction. It has also proved to be a useful planning tool when deciding which aspects of a course ought to be individualised.

If this table is used as a guideline when designing learning material, independent learning can be facilitated. The role of the facilitator in the system, both as a medium of instruction and as a medium for management control, is indicated. An indication of the style and type of instructional materials employed in the system, and the way in which learners select and have access to learning materials, are also specified.

Individualised instruction refers to the facilitation of learning responsibility. The learner should be encouraged to take control over the learning process. The

facilitator should stimulate active participation through learning activities, the evaluation of learning activities and two-way communication (Romiszowski 1984:10).

Since one grows educationally only when one's particular needs are met, and since the customary mass instruction cannot possibly furnish the variety of methods and materials necessary to meet the varying abilities represented in any group of individuals, it is imperative that a form of instruction be used that will, to the largest degree, permit each child (learner) to work according to his/her needs (Romiszowski 1984:4).

TABLE 2.5: Individualised instruction (Romiszowski 1984:9)

WHO makes the decisions?		WHAT course parameters are individualised?				
		Time and rate of learning	Materials and media	Sequence and methods	Content and examples	Objectives
Frequency of decision to individualise WHEN?	1. Total course	Student			←	System (diagnostic test)
	2. Every unit	→ Tutor and student ←				
	3. Every lesson	Student and system			System	
	4. Every learning step	Student			System	System

The designer should ensure that the learning material facilitates an interactive learning approach. Dialogue should be promoted between the learner and learning material so as to guide the learner towards constructed meaning. Most open and distance learning occurs independently of the teachers` presence, but dependent on the course materials they have prepared. The instructional designer plays a vital role in the facilitation of high quality learning.

2.3.3 The instructional designer

Instructional designers are sometimes referred to as educational developers. Because of a lack of funds the instructional designer, in practice, is often the subject-specialist or lecturer. Unfortunately, the subject-specialist does not necessarily have the skills, knowledge and time to act as instructional designer. It is, in fact, possible for a subject-specialist to act as an instructional designer, if the specialist is able to perform the following tasks as listed by Kamau (1993:194). The instructional designer should be able to:

- facilitate the requirements of the distance education learner;
- write topic outlines;
- include activities and provide feedback in the text;
- formulate outcomes;
- write clearly and precisely; and
- handle course administration issues.

There are a number of specific roles that instructors must undertake to facilitate quality, individualised instruction. Himstra & Sisco in Dills (1997:396) identify eight such goals. The facilitator should:

- serve as a content resource for learners;
- take responsibility for managing the assessment of learner's needs;
- employ the resources necessary for achieving personal goals;
- make use of a variety of instructional techniques;
- stimulate and motivate learners so that each learner can reach his or her full potential;
- help learners to develop positive attitudes about their abilities;
- evaluate if learners can reflect what they have learned based on each learner's personal experience; and
- evaluate learners` progress by making use of a number of evaluation systems (Dills & Romiszowski 1997:396).

Dills & Romiszowski (1997:817) describe the learning activity further as:

- analysing competencies to be taught;
- setting learning outcomes;
- selecting modes and media of instruction;
- determining learning methodologies;
- developing learning materials; and
- specifying the dimensions and methods for evaluating the learning progress.

By incorporating these design tasks learning and its theories can be facilitated.

2.3.4 Learning theories in relation to design

According to Seels (1995:237), constructivism dominates the field of instructional design. Learning theory developed into a more constructed environment, and facilitators became aware of the importance of the learners' performance. Instructional theory is thus deduced from constructivism.

Constructivism in instructional design emphasises individual thinking and the creation of meaning. Learning is considered to be a personal involvement in the education process. In order to understand the principles of constructivism in relation to design, Merrill & Twitchell (1994:141) defined constructivism as follows:

- Knowledge is constructed from experience. Learning is a personal interpretation of the individual.
- Learning is an active process of meaning-making based on experience.
- Learning is collaborative with meaning negotiated from multiple perspectives.
- Learning should occur in realistic settings.
- Testing should be integrated as a task, not a separated activity.
- Like instruction, assessment should be based on multiple perspectives.

The following instructional principles can be deduced from constructivism theory as compiled by Savery et al (1996:138-140):

- Anchor all learning activities to a larger task or problem.
- The learning outcome of each task should be clear to the learner.
- Support the learner in developing ownership for the overall problem or task. Learners should be encouraged to succeed in reaching the set learning outcomes and to develop a deep approach toward learning.
- Design an authentic task - the learning activities should be applicable to the learners' every day environment. Learners should be guided to apply their knowledge in order to solve problems.
- Design the task and the learning environment to reflect the complexity of the environment they should be able to function in after the learning task is completed.
- Give the learner ownership over the learning process - the facilitator should challenge the learners` thinking.
- Encourage the testing of ideas against alternative views and alternative contexts.
- Provide opportunity for and support reflection on both the content learned and the learning process.

According to Seels (1995:154), the consequences of the above instructional principles for instructional design can be described as a set of possible advantages and disadvantages. The possible risks and benefits are highlighted in Table 2.6.

TABLE 2.6: Advantages and disadvantages of constructivism

ADVANTAGES	DISADVANTAGES
Possible benefits include	Possible risks include
• meaningful learning outcomes that are likely to be used in relevant context.	• more costly instruction.
• meaningful participation of the learner in the learning process.	• greater need for instructional resources and information management.
• developing independent problem-solving capability in learners.	• less coverage of material.
• flexibility in design activities.	• less demonstration of specific skill mastery.

(Table 2.6 continued

ADVANTAGES	DISADVANTAGES
Possible benefits include	Possible risks include
• flexibility in instructional activities.	• chaos and confusion if poorly implemented.
• acknowledgement of social and motivational factors in learning.	

Knowledge or learning is thus considered to be a personal rather than an objective involvement. 'Constructivists are far less interested in the learner's ability to simply acquire knowledge and to produce the *right* answers than with the learner's ability to apply and manipulate knowledge within an authentic task environment' (Seels 1995:184).

The role of constructivism in instructional design is summarised by Seels (1995:237) with three principles:

- Learning should be designed so that learners study information at their own pace and time.
- The learning process is just as important as the learning outcomes.
- The context of learning and assessment is co-joined in authentic learning contexts.

It could be assumed that the constructivist approach is best suited for quality distance education. 'It follows that learning is greatly enhanced when knowledge is learned in a specific context, in the service of a problem that needs to be solved, or in order to attain a specific cognitive goal, rather than a de-contextualised and abstract body of knowledge' (Polson 1993:30).

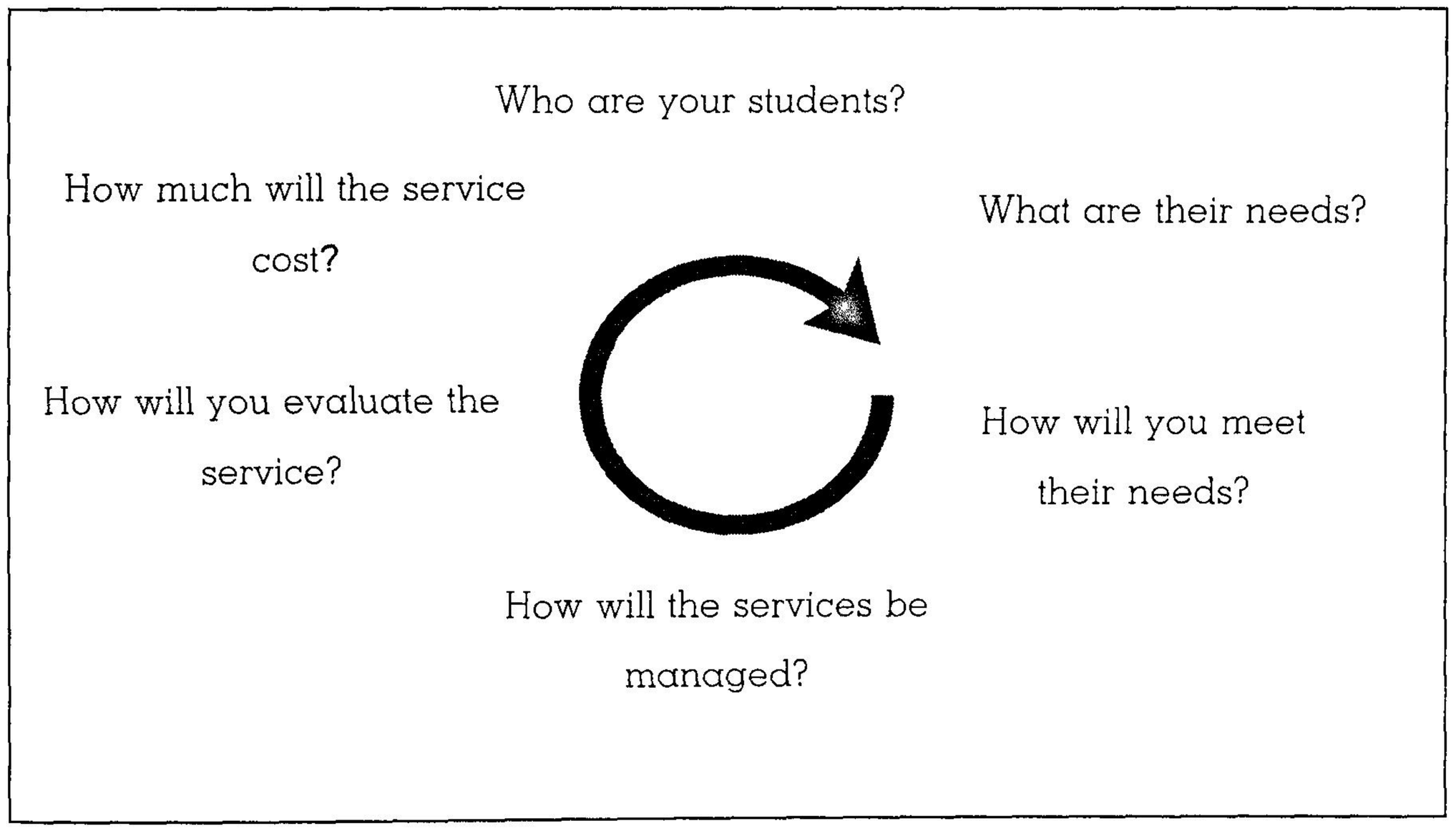
Through following the suggested constructivism design steps, the learner will be motivated to act as an individual in the learning process. Learners will also be able to apply their knowledge to solve problems they might come across in their work situations.

2.4 WHAT ARE THE MOTIVATIONAL PRINCIPLES INVOLVED IN A DISTANCE EDUCATION PROGRAMME?

Apart from guiding learners to take responsibility for the learning process, the facilitator should also structure other motivational devices. This could be achieved by providing learning support services.

In order to support the learning process the facilitator should know and understand the learner. Learning support services aim at providing the often isolated learner with learning and didactical feedback. These support services can be provided via a wide range of media, for example, by telephone, face-to-face contact or correspondence. The support services should include total service provision for learners and should take learner perspective into consideration. Figure 2.9 suggests a number of questions to be looked at when planning student support services.

FIGURE 2.9: Planning student support services (Lockwood 1995:233)



The instruction should guide the learner through the learning process by means of various support systems. It is the task of the facilitator to motivate and encourage the learner (Oosthuizen 1997:71).

> The challenge is to develop and maintain approaches which enable learners to have their voices heard and for the open and distance educators and their institutions to be able to listen and understand the practical implications of what is being said. Learners should also recognise that they are a part of a diverse body of people whose interests need to be voiced and whose stories need to be told (Evans 1995:234).

Distance learners have a need for frequent communication between themselves and the facilitator. Because of the distance, this is not always possible. A back-up system in the form of tutors needs to be established. Even by making use of tutors, effective communication may still be a problem. A tutor and group learning projects can be employed to solve the possible communication problems.

2.4.1 Tutors

The tutor can be trained to act as a mediator between learner and facilitator. The selection of tutors is extremely important. Tutors should possess a number of qualities. The distinctive qualities of a tutor as summarised by Moore & Kearsley (1996:148) are as follows:

- excellent subject matter knowledge;
- good general teaching skills;
- good communication and social skills;
- well organised, flexible, and patient;
- ability to motivate and encourage learners; and
- committed to learners and programme.

A tutor having these personal and professional characteristics could be employed to:

- discuss course content;
- provide feedback on progress;
- grade assignments and tests;
- help learners to plan work;
- motivate learners;
- answer administrative questions;

- supervise projects;
- teach at face-to-face seminars;
- keep student records;
- intervene on behalf of learners with the administration; and
- evaluate course effectiveness (Moore & Kearsley 1996:148).

A tutor system will, however, only be successful if the distance learning institution, its lecturers and the tutor treat the student's learning success and the total development of the distance learner as a top priority and regard the achievement as a team effort. 'This provision should ideally be available whenever and as often as the student needs it and is part of the richness and variety of a system that can adapt to the needs of individualised, independent study' (Sewart et al 1983:36). Group learning activities can also be facilitated to ameliorate the isolation of the distance learner.

2.4.2 Collaborative learning

Learners should be encouraged to make contact with others in the form of group learning or discussions. It is suggested that distance learners should be involved in formative learning or group learning activities. According to Escotet (1992:96), such group activities could involve:

- **Study circles:** Groups of learners who analyse and discuss learning content by themselves.
- **Group Academic Tutorials**: A group of learners meeting with tutors discussing perceptions of learning material.
- **Didactic groups:** Applying knowledge in the working environment. This could include discussing, developing and the exploration of case studies.
- **Socio-cultural activities:** These activities should form an obligatory part of the curriculum, be it as an extra-curricular or a co-curricular activity.
- **Activities of belonging:** Activities which tend to make the learners identify with the university in order to heighten their sense of belonging.
- **Two-way communication:** By means of guided didactic conversation.

By being involved in a study group, learners can communicate their problems and ideas. The isolation linked with studying at a distance can therefore easily be

ameliorated. Further communication can also be facilitated through the selection of an appropriate delivery mode.

2.5 WHAT PRINCIPLES DETERMINE THE SELECTION OF AN APPROPRIATE TECHNOLOGICAL DELIVERY MODE?

A question that is commonly asked by facilitators is whether media selection influences learning. In order to answer this question two opposing opinions will be given.

According to Lamsdale & Mielke in Clarke (1994:21), media have definite economic benefits but no learning benefits. 'If categories of media can be related to the types of learning that they are particularly suited to, then learning classifications may offer a way to integrate media selection, with philosophical approaches and objectives' (Seels 1995:205). One can thus assume that it is the method of learning employed that influences learning. Media is only the method of delivering the information. Clarke further claims that any necessary teaching method could be designed into a variety of media presentations. 'Media and their attributes have important influences on the cost and speed of learning but only the use of adequate instructional methods will influence learning' (Clarke 1994:27). According to Clarke media, therefore, does not influence learning.

Kozma (1994:7-8) refers to the same argument by rephrasing the question as not *do* but *will* media influence learning. He states further that if there is no relation between media and learning, it may be because we have not yet formulated one. In Kozma's opinion this lack of a relation between media and instruction stems from the surface learning, behaviouristic approach to instructional design. The behaviouristic approach does not incorporate the cognitive, affective and social process present when learning. 'The medium is considered an inert conveyer of an active stimulus to which the learner makes a behavioural response' (Kozma 1994:8).

Kozma emphasises that with the shift towards constructivism, learning is rather perceived as an active, constructive, physical and social resource that creates new knowledge by interacting with information in the environment and integrating with

information already stored in memory. Knowledge and learning are neither a property of the individual or of the learning environment.

Kozma suggests that media can influence learning by facilitating an interaction between internal and external resources. 'Consequently, we will understand the potential for a relationship between media and learning when we consider it as an interaction between cognitive processes and characteristics of the environment, so mediated' (Kozma 1994:8).

The hypothesis can be formulated that media selection is an important part of the learning experience. By incorporating media, learning can be made interactive and interesting while at the same time it helps the learner to understand and apply the knowledge learned. The media are used as a tool to deliver instruction. The selection of media is therefore key in the facilitation of affective and meaningful learning.

2.5.1 Media selection

The importance of two-way communication in distance education has already been referred to under the guided didactic conversation theory. In order for two-way communication to take place between the facilitator and the distance learner, media are employed. 'Distance education is sometimes called *mediated instruction* in order to stress the decisive importance of technical media which have to be used in order to bridge the distance between teacher and student. In fact, in distance education teaching and learning cannot take place without them' (Peters 1992:32). Media selection is therefore referred to as a delivery system.

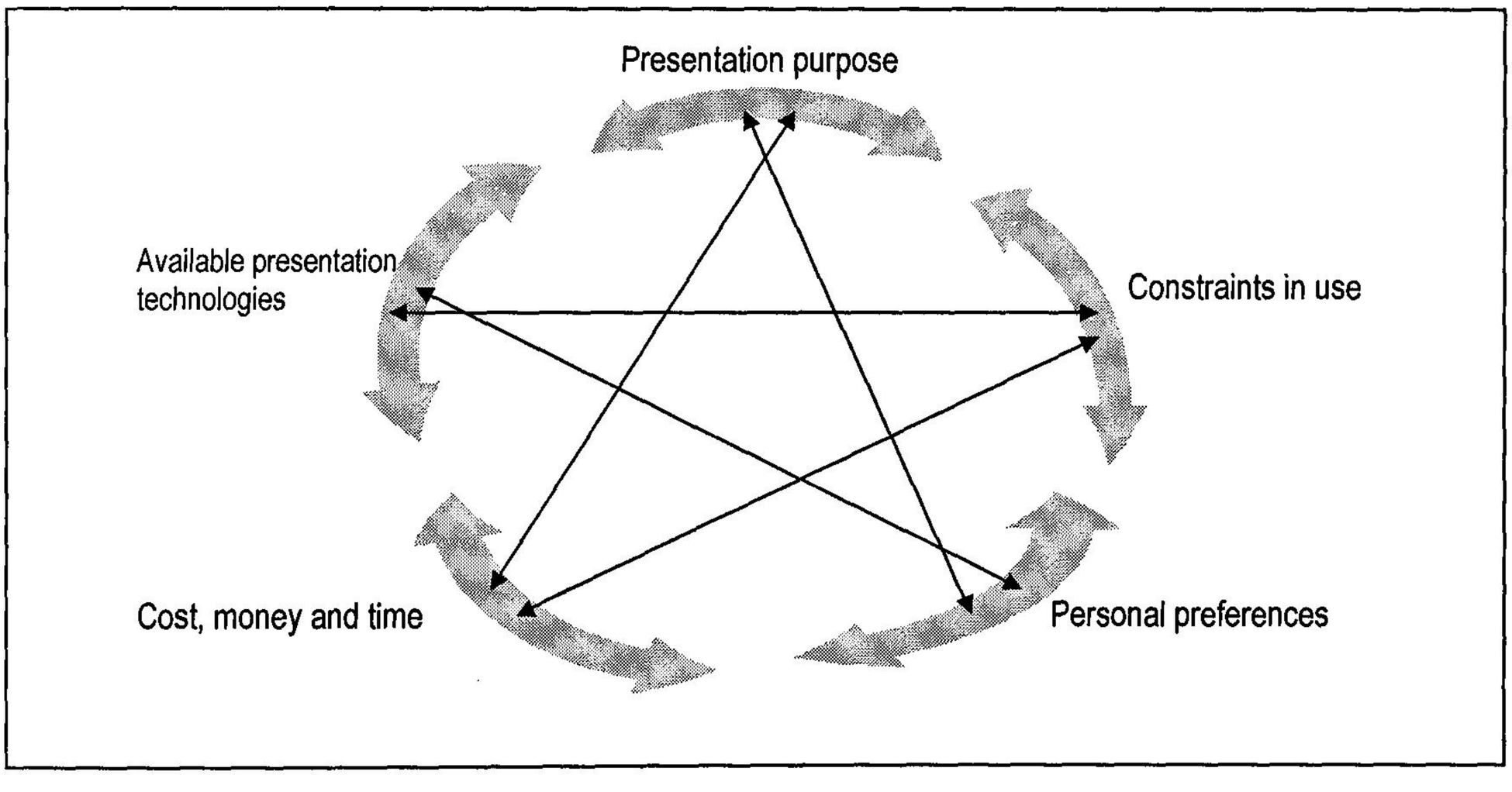
Two categories of delivery systems can be identified, namely instructional and informational media. *Instructional media* facilitate two-way communication between the learner and the facilitator. In comparison, *informational media* present the information but do not facilitate communication.

Thomas in Parer (1994:92) lists the following factors as being important when selecting the delivery system. The outcome is to select the most appropriate media for a given learning environment by:

- evaluating the nature of the activity or learning task;
- being knowledgeable of the functional, production and presentation capabilities and limitations of educational media available and of the environment in which the media will be applied;
- estimating the costs involved in the preparation, production, distribution and use of instructional materials;
- considering the learning style preferences of learners; and
- researching the availability, accessibility and convenience of using particular media.

The interrelationship of the above considerations and the flexibility in choosing a starting point are clearly indicated by Figure 2.10.

FIGURE 2.10: Interactive factors of media selection for distance education (Thomas et al 1994:92)

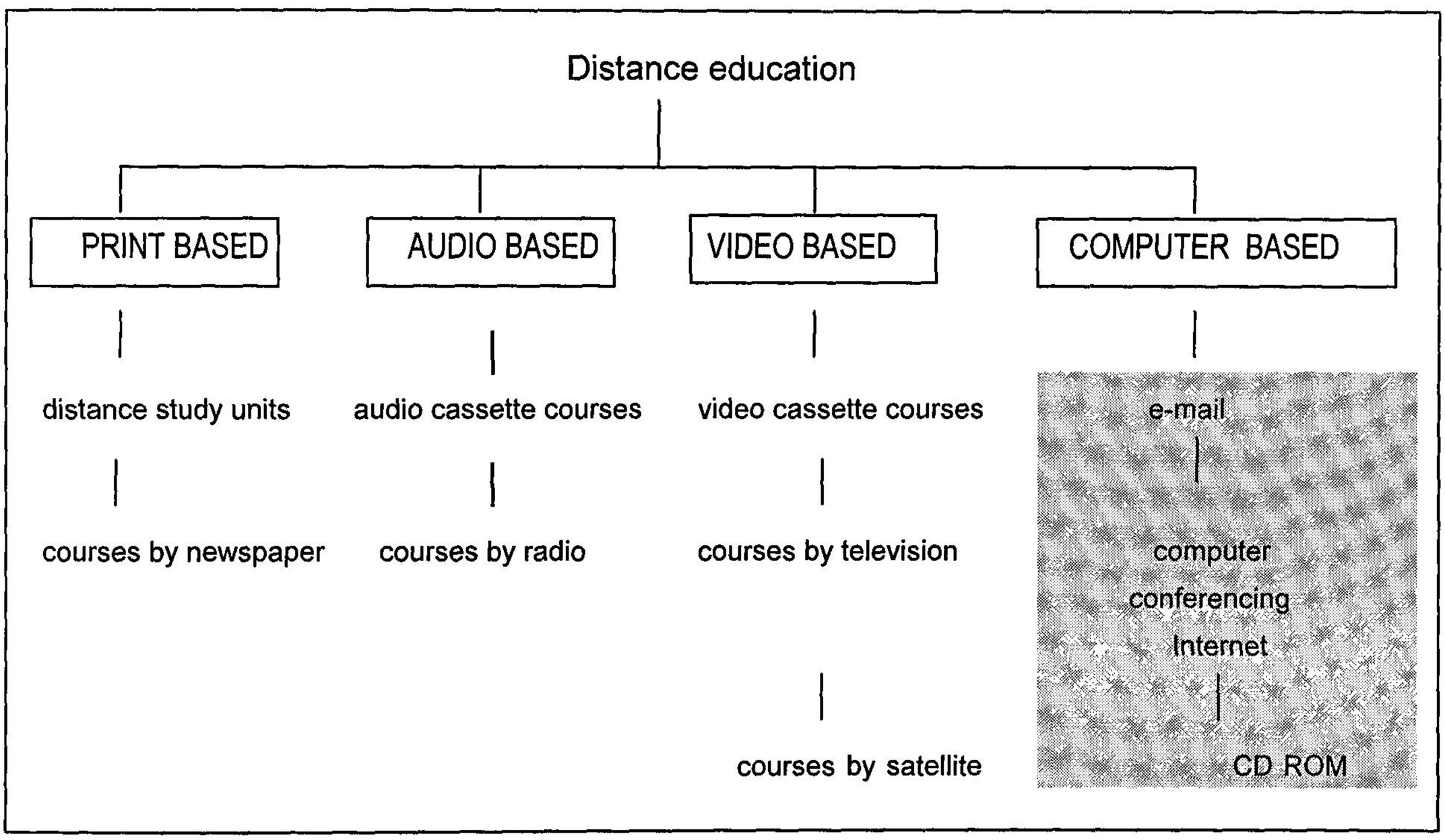


Through the choice of media the facilitator aims to communicate messages or information. According to Moore & Kearsley (1996:96), the outcomes of the media selection should be to:

- motivate learners;
- facilitate the recollection of information;
- provide learner stimulus;
- activate the learners` responses;
- provide speedy feedback; and/or
- encourage the correct use.

A number of delivery systems should thus be taken into consideration when planning a learning programme. The facilitator should select the medium that would enhance and facilitate the learning material best. Figure 2.11 categorises the types of media usually present in distance education programmes.

FIGURE 2.11: Delivery modes common to distance education practice



In order to identify the delivery system that best suits a learning programme's requirements, the pros and cons of the different systems should be compared. The following Table, 2.7, portrays the advantages and disadvantages associated with different types of media (Thomas et al 1994:95-105; Moore & Kearsley 1996:34-37).

TABLE 2.7: Advantages and disadvantages of different types of media

ADVANTAGES	DISADVANTAGES
PRINTED TEXT	
1. Portable and easy to use.	1. Inappropriate for some skills: involving animation, motion, complex sequences.
2. Adaptable to a variety of learning situations: learning, revision, reference.	2. Inaccessible for visually impaired learners.
3. Economically cheap to produce and revise.	3. Tend to force a sequence of learning.
4. Ease of distribution.	4. Difficult to provide a variety of stimuli: reading and performing actions.
5. Comfort - familiar and non-threatening to user.	5. Expensive when incorporating colour.
6. Reliable - is not dependent on external factors.	
AUDIO CASSETTES	
1. Inexpensive to produce.	1. Visual stimuli can interfere with hearing.
2. Fast and inexpensive copies.	2. Can easily become passive and non-involving.
3. Portable.	3. Speed is set (cannot go faster or slower).
4. Used in variety of locations.	4. Learning requires considerable listening concentration.
5. Private method of studying when using ear pieces.	5. Longer tapes are prone to break when often used.
6. Easy access to text.	
7. Can be used in conjunction with text.	
8. Replayed as often as necessary.	
9. Reusable.	
VIDEO CASSETTES	
1. Show things that are normally inaccessible.	1. Interference and distraction of images.
2. Present previously recorded information.	2. TV images are restricted in the production of images.
3. Bring viewers close to the action.	3. High production costs.
4. Present a magnified image of small objects.	4. Copyright of programmes used for teaching.

(Table 2.7 continued)

ADVANTAGES	DISADVANTAGES
VIDEO CASSETTES continued	
5. Add enhancements to an image: text or graphics.	
6. Provide models of behaviour.	
7. Demonstrate processes and skills.	
8. Provide feedback on personal performance.	
COMPUTER ASSISTED LEARNING	
1. Ideal where computers are in use.	1. Expensive to produce software.
2. Large numbers of learners need to repeat exercises.	2. Hardware requirements can limit potential applications.
3. Engages learners in controlled interactions.	3. Hardware needs to be updated on regular basis.
4. Can integrate assessment and progress reports.	4. Incompatibility of different programmes on PC's.
5. Provides controlled and repeated animated sequences.	5. Programmes become expensive text based page turning systems.
6. Easily updated when necessary.	6. Computer learning programmes are not easy to browse. Difficult to refer back to information.
7. Can import colourful graphics.	7. Most programmes do not have a place mark function.
8. Can be integrated with other media.	

From the Table 2.7 one can deduce that all the delivery systems have certain factors in their favour and others against. These advantages and disadvantages should be compared in order to select the most appropriate form of media. 'It is clear that achieving specified educational goals in distance education is not just a matter of choosing an appropriate set of teaching media and methods but is also a matter of using them appropriately, especially in order to achieve active rather than passive learning' (Sparkes 1992:144). The inclusion and design of various types of media in the learning process will be discussed in further detail. By incorporating authentic tasks, situated learning experiences and interactive media, learners are guided through instruction that provides concrete and meaningful experiences which are appropriate for today's world (Olson 1995:54). The use of printed text, audio and

video cassettes and computers as delivery modes will be discussed in the following paragraphs.

2.5.2 Printed text

Print-based material is the most common form of distance education delivery. Laurillard (1993:98) gives the following reasons why print-based material is considered as the most important educational medium. Print-based material is the easiest medium to:

- Design: a single author can compile the learning material.
- Produce: publishing mechanisms are established.
- Deliver: books are readily available in bookshops and libraries.
- Handle: the portability of books make them easy to handle.
- Use: random access to information is possible.

In printed material the facilitator presents the information, but the learner is able to control it. Learners can decide on the sequence of learning and revision that they would like to follow. Print-based material has the limitation that it does not always facilitate interactive involvement. However, in order to overcome this problem, certain design principles can be applied. According to Laurillard (1993:110), these principles include:

- formulation of learning outcomes to clarify the goal of the instruction;
- asking in-text questions and providing in-text activities;
- providing supplementary information via audio and/or video cassettes; and
- facilitating self-assessment activities.

The printed text is often combined with video and sound cassettes to enhance the learning activity. Although audio-vision is a highly underrated educational media learning can be successfully facilitated by combining auditory and visual stimuli.

2.5.3 Audio cassettes

The inclusion of audio cassettes is imperative in a Music Education programme. Sound should be considered to be the core of music and Music Education. 'When any music experience takes place, it is being intentionally or unintentionally listened to' (South Africa 1995b:78). In Music Education learners are introduced to music either by creating their own music through singing, instrumental playing and creativity or by listening to music examples.

Audio cassettes can be successfully used to present music of different styles and genres. By listening to music learners can become aware of good quality music. The following factors should be taken into consideration when sound examples are selected:

- Suitable music examples should be selected to underline the learning outcome of the listening activity.
- The material should be selected with the listening environment in mind. The learners should know what the purpose of the listening activity is.
- The selected sound material should be relevant to the learners' age and level of comprehension.
- Short music examples should be selected that explain the purpose of the listening activity.
- The recorded music should be of good quality.
- The selected material should not violate the copyright laws.

Learners should be encouraged to become active participants in the learning process. The learning material accompanying the audio cassette should therefore facilitate activities for the learner to engage in, whilst listening to the examples. Learners could be asked to design a listening guide or questionnaire. By doing so they get the opportunity to highlight and recognise the elements of music.

2.5.4 Video cassettes

The focus is here not on interactive television but on the use of video cassettes in the learning programme. By incorporating video cassettes in the learning process the facilitator can show the learners material that would usually be inaccessible.

Videos are a multi-sensory method of teaching. This is an important factor in distance education where the facilitator is not present. Through looking at video material learners are introduced to information as well as a variety of sound and audio stimuli. Learning does therefore take place by means of auditive and visual encouragement. Videos in the learning programme can be used to:

- explain and highlight the history of music.
- show learners didactical approaches in practice;
- demonstrate teaching processes and skills;
- explain and demonstrate the practical components of a subject; and to
- compare and evaluate various teaching strategies.

It is, however, important that the learners are guided in their use of the video material. They should know what and why they are looking at the video. Specific tasks and/or outcomes should be highlighted prior to looking at the video (Thomas et al 1994:98).

2.5.5 Computer assisted learning

Computer assisted learning is traditionally divided into three sections:

- computer-managed instruction;
- computer-assisted instruction; and
- computer-based instruction (Romiszowski 1984:25).

- **Computer-managed instruction**

Computer-managed instruction gathers and processes information about the learning programme and the learners' progress. 'Computer-managed instruction uses the capability of the computer to manage the progress of a student through a programme of instruction' (Romiszowski 1984:25).

- **Computer-assisted instruction**

The purpose of the computer in this mode is to present instruction that is simple, straightforward and individualised for each learner. In computer-assisted instruction the instruction is administrated by a computer. This is done through the facilitation of

drill and practice exercises. Through assimilating real situations the learners are given the opportunity to apply their knowledge in practice. The computer keeps record of the learners' progress and this is used to monitor their progress (Romiszowski 1984:26-28).

- **Computer-based instruction**

Computer-based instruction refers to learners' use of learning programmes on a private computer (Moore & Kearsley 1996:34-37). This includes CD-ROMS and Web-based courses. With computer-based learning aids, the computer is used as a tool in the learning process. The computer assists the learner in structuring the learning material thereby becoming a tool to assist the learner in the thinking process (Romiszowski 1984: 29).

An important difference between computers and other forms of media is the number of control capabilities the computer offers. These capabilities include the ability to present and receive, process and manage information. By involving a computer in the learning process a number of tasks can be performed. The computer can adapt to different levels of learner expertise and can act as a learning tool to help the learner, no matter what his/her current level of knowledge is. Audio visual media and computer assisted learning are traditionally considered to be separate. With the development of new hardware and software technologies it is, however, possible to combine the two as part of interactive computer assisted learning (Jasper 1991:161-162).

- **World Wide Web (WWW)**

Computer-based instruction includes Web-based learning. 'The increased use of computers in our society, resulted in the increase in Web-based courses. This is mostly due to the need for less expensive courses and the ever growing need for learner convenience' (Pieterse 1998:44). Web-based and computer-based instruction employes the interactive, multimedia technologies of the Web as well as the world-wide structure of the Web to deliver and support a course. Originally the Web was used as a static medium for presenting text and graphic examples. Interactive use of the Web is, however, now becoming increasingly popular. By encouraging learners to make decisions and answer questions they take control over the learning content. 'Interactivity is a necessary attribute of any successful educational technology. Learning is generally more effective when the learners can

control the information exchange' (Fouché 1998:51). The need for cheap, easily accessible learning opportunities has increased the importance of Web-based instruction.

With the increased development on the Internet, the merging of audio and visual stimuli becomes common practice. 'Instruction through the WWW is computer based and involves interactive multimedia technologies and resources as well as world wide support and information structures' (Pieterse 1998:43). Apart from these advantages the following advantages and disadvantages were compiled, in Table 2.8, from Pieterse (1998:43) and Harasim et al (1995:12-15).

TABLE 2.8: Advantages and disadvantages of Web-based instruction

ADVANTAGES	DISADVANTAGES
Cost efficient No travel and accommodation expenses are involved. The learner only needs to subscribe and log on to the Internet.	**Band-width limitations** The available band-width limits the accessibility of the material on the Web. This problem will increase as more people subscribe to the Internet.
Available and convenient The Internet is always available. This enables learners to access information at their own time and pace.	**De-humanisation** Computerised instruction results in the learner not having personal contact with the facilitator. Learning becomes an impersonal experience.
Efficient Learning material can easily be changed and adapted.	**Static instruction** Lack of contact between the learner and facilitator results in the learning process becoming static.
International Learning programmes can be accessed across geographical borders.	**Developmental constraints** To develop Web-based instructional material is time and resource consuming.

(Table 2.8 continued)

ADVANTAGES	DISADVANTAGES
Communication Internet learners can make contact with other learners via chat rooms and e-mail.	**Computer constraints** Not all material can be effectively presented on the Internet. Certain subjects should have an interpersonal background.
Control over learning The Internet encourages learners to become explorers and discoverers. Learning can easily become individualised.	**Information overload** If the learning tasks and information are not clearly structured learners can easily experience a learning overload.
Resources Online studying enriches the learning material and environment and introduces learners to new ideas, perspectives and cultures. Cross-cultural understanding is facilitated.	**Power failure** Power failures prevent access to the learning material.
Access Learners have equal access to information and the facilitator. Learning is an equal opportunity for all participants.	
Active learning All learners are expected to become active participants in the learning process.	
Confidential Learners' personal questions can be answered confidentially by using e-mail.	
Encouraging Immediate certification of completed courses are possible via the Web.	

■ Designing Web-based instruction

When designing a Web-based course one cannot take a written, paper-driven handbook and copy it onto the Web. The Web will then only be used as an electronic page turner. Academics that have presented their courses in this fashion on the Web have found that learners simply download the information and study from the printed text. Khan in Le Roux (1998:67) describes the correct use of the Web as a learning facilitator by explaining that the Web should be an instructional strategy which should use its attributes and resources to create a meaningful environment where learning is fostered or supported. The Web should therefore be used as a thinking tool that facilitates understanding and self-testing. Because Web-based design is still a relatively new field of design, few design guidelines exist for the WWW. Traditional instructional design principles are applied to the field of Web design. General design principles are given by Harasim et al (1995:145) and Barron & Tai (1998):

- Identify the need and educational activity that can be presented as an online activity.
- Ensure access to the requisite computer resources and systems. The programme designer should ensure that access to the Web-site is possible and convenient. This could be done by using standard software which is regularly available.
- Obtain administrative support. Support systems should be in place to help with system or learner problems.
- Design the curriculum. The Web document will be most effective if the content and learner population are analysed. The structure of the course should be determined. This includes the formulation of learning outcomes and facilitation of skills.
- Develop educational material. After the curriculum outline is determined the content of the course should be structured.
- Design the online environment. The actual design involves the selection of the most appropriate software and design tools.

■ Designing the online environment

When designing an interface, the following aspects should be taken into consideration (Möller 1998:160; Kearsley 1985:211; Barron & Tai 1998):

TABLE 2.9: Interface design

Parameter	Application
Menu	• A variety of menus should be provided from which learners can choose their learning focus.
Screen layout	• A consistent layout should be used throughout the material. • The control options for e.g. the mouse button should be at the bottom of the screen. • Information should be functionally organised. • The layout should be uncluttered. • All pages should be titled. This will indicate the page's position within a larger document hierarchy. • Indicate a date on all pages. This will show the browser when the document was last updated. • Include copyright notices in the footer of the page. • Include the URL on each page. This will help the browser to re-visit the site at any given time. • Design for a variety of browsers. • Pilot test your Web page with the target group. This enables you to sort out problems before the site is launched internationally.
Colour	• Limit the colour pallet per screen to not more than six colours. This does, however, depend on the complexity of the screen design. • The selected colours should be consistently used throughout the design. • It is important to choose colours that are compatible. • Always select text and background colours to create contrast. • Highlighting should be used sparingly.

(Table 2.9 continued)

Text	• Sentences and paragraphs should be short and well formulated. • A 'clean', easy to read font should be used. • Avoid full screen scrolling. • Use bolds and italics sparingly seeing that many browsers don't recognise them. • Limit the length of text lines as this will increase readability.
Graphics	• The included graphics should highlight and/or explain the text. • The graphics should underline the learning material. • Limit the size of graphic files. • Limit the number of graphics on each page as this will decrease the transfer time of the document.
Animation	• Special effects can be used to indicate a change of frame. • Animation is also used to draw learners' attention to important information.
Sound	• Sound becomes essential if listening is part of the learning sequence. • Sound can, however, also be used to attract learners' attention. • Use only where appropriate.
Video	• The inclusion of video material enables the facilitator to include realistic examples from, for instance, good teaching practice. • In order to make the multimedia elements accessible to all platforms they should be stored in standard formats.
Interactivity	• Learners should be encouraged to become interactive participants in the learning process. • If interactivity is not facilitated, then the computer is used as paper-driven material. • Provide a method for feedback. It is important for the learner to know who is in charge of the Web page and who should be contacted.

The aim of Web-design should be to design an effective method for disseminating information that is appealing and offer an easy-to-investigate interface (Barron 1999:5).

CONCLUSION

Learners' active involvement in the distance education environment is crucial. This can be accomplished in a variety of ways: by watching, reading, writing, speaking and interacting with the presenter, facilitator and tutor.

Quality distance education must include first-rate instructors, a smooth delivery system and well organised administrative and instructional support. An appropriate infrastructure should ensure that all these functions exist and work together to enhance the learning process. Course delivery should carefully weigh learner contexts, such as the multicultural, diversity and equity concepts in education.

Distance education as a solution to current and developing education problems is also discussed. De Munnik (1993:87) indicates that the lack of contact between learners and facilitators would necessitate the handling of learners as individuals. This results in the encouragement of distance education learners to take full responsibility for their learning.

Quality learning can only occur if the learning programme is properly designed and managed. This would involve consideration of who the learners are, how they learn and what they want from the learning experience. Learning behaviour and theories should thus be incorporated into the learning process and should be presented by means of the best suited educational media. It is therefore not necessarily the most advanced technology that will ensure that learning is successfully facilitated. The selected delivery mode should be accessible and affordable for all learners involved.

> Distance education may be defined as the family of instructional methods in which the teaching behaviours are executed apart from the learning behaviours, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices (Moore & Kearsley 1996:26).

From the literature review the parameters of quality distance education and instructional design can be deduced.

- **Quality distance education is characterised by:**
- gathering information about the target group;
- selecting the most appropriate learning theory;
- incorporating various learning experiences;
- facilitating individualised, self-paced learning instruction; and by
- appointing a delivery mode(s);

- **In quality instructional design:**
- learning outcomes are clearly stated;
- the layout and structure of learning material is meaningful;
- icons are used to guide the learner through the learning material;
- self-assessment questions and activities are facilitated;
- feedback on assessment is given;
- the tone and style of the text is reader friendly and personal;
- graphics, diagrams and other illustrations are used to highlight and explain the text; and
- assessment criteria are given.

These principles can now be applied to the design of the DMEP in Chapter 3.